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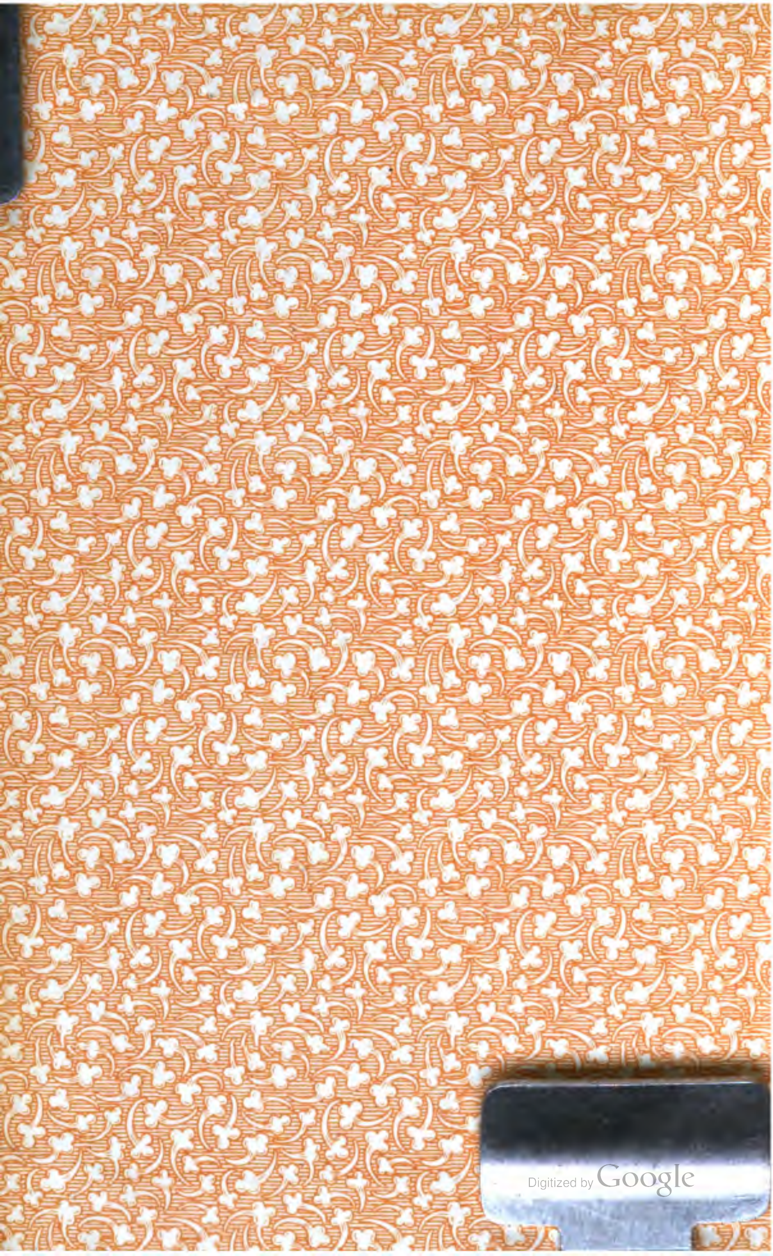

Riverside Educational Monographs

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THE EDUCATION OF THE NE'ER-DO-WELL

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EDITOR'S INTRODUCTION

So long as the school's standards are academic rather than social, it is inevitable that the schools themselves should be institutions primarily concerned with those who have a special genius or talent for the formal or abstract intellectual disciplines. In the past our educational system has undoubtedly favored the scholastic turn of mind. It has neglected the training of other types of mentality, such as are required in industry, art, and business. The usual route to these large groups of occupations was, at one time at least, the route of failure at school. This was particularly true of those who were destined to perform the minor services in these fields of labor.

Traditionally, mental power was held to be coincident with the narrower limits of academic ability, an assumption to which the thoughtful pedagogue will not subscribe in these days of more careful professional thinking. This fallacy was a tragic one for many human beings. Thousands of school children, who were not vitally gripped by school activities and who, in consequence, were not mentally enlisted to the fullest possible degree, led a life of discouragement at school. These concluded that the school's judgment was more or less complete and final, and accepted the school estimate that they "were not smart." Parents and public acquiesced in the current psychological mistake. Further education for them seemed useless. In consequence they made no further demands on the school, dropped out, and found employment in whatever part of the world's work was open to them.

From this eliminated group of half-trained youth, the "ne'er-do-wells" of the world have been recruited. It is not to be wondered at that discouraged boys and girls, who drift into the routine jobs of industry at a very youthful age with little general education and no special vocational training, should fare badly as they grow older. The conditions are against them. They enter life with a sense of failure, to work at tasks that are so simple that there is little stimulation to rouse whatever slumbering powers they really do possess. Soon the horde of younger "school quitters" push them out of their jobs, and they find themselves grown older without increased ability to assume the more complicated tasks appropriate to their age. Their labor tends to become intermittent, and even where simple, permanent tasks remain open to them, the return is too inadequate to permit of an independent, self-respecting economic life.

The "ne'er-do-well" has always been a social problem, and now, because the school has accepted a social point of view, he becomes an educational problem. What shall the school do with him?

Doubtless some of the "ne'er-do-wells" are born such, but the vast majority can be saved if the school system will adapt itself to that portion of the population which it has previously "scrap-heaped." The needed reconstruction of the schools will involve a pursuit of four fundamental policies.

(1) The elementary-school curriculum must be made broad enough to include every fundamental mode of utilizing mind which society employs in the conduct of its affairs. This will encourage each type of useful success and give to every variety of mind that interest and growth which are necessary to power and self-confidence in doing the day's work. It will lengthen the period of schooling and eliminate the tragic sense of failure with which so many now enter life.

(2) The teaching of the elementary school must undergo radical pedagogical improvement.

Problems to be studied must be made to arise in vital and natural ways so that the child himself recognizes the need for all the mental ado which the teacher requires. Study and action must be so connected that thoughtfulness, memorization, practice, and all the other school activities shall have an apparent and worthy consequence. Those who are sustained by values which a cultural environment fixes may well take to study on faith, but those who are culturally and economically less fortunate feel only the practical pressures of life and need to understand the practical relation between study and the life which it is designed to solve. For those who cannot accept the dictum that truth is valuable for its own sake, we must provide a dynamic pedagogy, one which constantly establishes a functional relation between school activity and social problems.

(3) That philosophy of the elementary school, which determines the attitudes of its managerial and instructional staff, must be revised so that justice shall be rendered to the entire school population. This involves less stressing of the school's ancient prerogative of selection and rejection, and the fuller recognition of the school's new work as a human clearing-house, where tal-

ents are distributed to the particular courses of training and lines of occupation where individual ability may count for the most in actual achievement. Educational and vocational direction must become a basic function of the school system however imperfectly it may be performed.

(4) And, finally, the school system must become more intimate with life itself. A considerable degree of part-time education must be established. The early stages of schooling and working must be correlated through regulated apprenticeship, half-time study and work, the continuation school, or other coöperative plans. Under such a system of alternation, the youth will see many needs for schooling of which he was previously unaware. Responsibility provokes thought and the need for more information and wisdom. In this manner, the period of intellectual growth will be greatly prolonged, and the desire for knowledge and skill strengthened.

The methods by which these policies have been inaugurated and expanded is the substance of this volume. The experiences cited are invaluable to the educator. The solutions proposed are constructive attempts looking toward a better social and educational economy. No one who wishes to give a wide reach to our newer educational efficiency will fail to receive substantial aid from an author who has brought personal and professional experience to bear thoughtfully on an important human problem.

PREFACE

During the last ten years, the author has had considerable experience dealing with the problem of the large number of boys and girls of limited ability who have to leave school early, and who, under the prevailing system, fall into "blind-alley" jobs without the possibility of advancing in school or receiving a parallel enlightenment which will make life, as a whole, significant.

The subject is presented first by a complete analysis of the problem from the social and economic side, then from the personal or psychological side: followed by a study of experience on the subject, ending with very concrete suggestions as to how the problem is to be handled with every educational phase in mind.

This monograph is written to offer suggestions as to how to meet this educational problem. Some of the ideas expressed in this book have appeared previously in former articles, written by the author, in the *Atlantic Monthly*, *Scientific American*, and *Education*.

W. H. D.

THE EDUCATION OF THE NE'ER-DO-WELL

I

THE NEGLECTED NE'ER-DO-WELL

A PROBLEM that is of great economic and vast sociological importance is the rapidly growing army of the unemployed, the great majority of whom are not qualified to fill positions requiring skill or special training, and yet lack the education necessary to enable them to undertake anything but manual labor. A great many social workers and educators of this country feel that the sources of these conditions lie in our educational system.

In order to determine this fact, in 1905 a commission was appointed in Massachusetts to investigate the needs for education in the different grades of skill and responsibility in the various industries of the Commonwealth, to investigate how far the needs are met by existing conditions, and to consider what new forms of educational effort may be available. The commission naturally first studied the need of industrial education in the great manufacturing centers. In the course of their investigations of the condition of the employment of children between fourteen and sixteen years of age, they found that nearly five sixths of the children in the mills have not graduated from the grammar schools, and a very large proportion have not completed the seventh grade, while practically none had a high-school training. To be more specific, a conservative estimate would be that every year in the State of Massachusetts from twenty thousand to thirty thousand boys and girls, on reaching the age of fourteen, leave the schools to go to work. This army is four times as large as the group which, at approximately the same age, enters the high school. Only one of every six of these children taking up some wage-earning occupation has reached the eighth year or grade of the elementary schools, only one of every four has attained the seventh year, only one out of every two the sixth year. The record of the number of pupils that enter the high schools and colleges in Massachusetts is as good proportionally as any State in the Union. So that the above figures would be conservative figures for the rest of the country.

These pupils leave school as soon as the law allows them and experience no difficulty in obtaining work, at a high initial wage, in what are called by our social workers "blind-alley" or "dead-end" employments, that is, employment such as messenger boys, attendants in bowling alleys, attendants in glass factories, doffers, etc., in mills. Practically two thirds of the children that leave school as soon as the law allows are employed in textile-mills. An examination into the juvenile work in a mill will show that a boy or girl who applies for a position is given some one operation at a machine which runs very rapidly day in and day out. As the result of performing this operation day after day, it becomes a habit, and is done without mental effort. This is particularly true with certain industrial operations, as "doffing" on the spinning frame, — replacing full bobbins with empty ones, — and "piecing," — placing broken ends of yarn together. This work can be performed to the best advantage by young people from fourteen to seventeen, and depends upon dexterity of the fingers. The juvenile worker begins and leaves work at the stroke of the bell, when the machinery moves and stops, and really becomes a part of the machine. This continues till the age of seventeen, when the fingers become too stiff to do the work, and the boy or girl is practically turned into the street, having gained no knowledge or skill for future use. If a boy during these years has a natural curiosity for information about the processes that precede or follow his own operation, the machine he tends, or the power that drives the machine, or the simple ordinary calculations used in figuring speeds, drafts, etc., he has little opportunity to learn; and if he asks about what little he sees, older workers will tell him to find out as they did. The whole atmosphere around the mill is such as to stifle the propensity of young people to learn. If the boy desires to change to another department in order to learn the different processes, the overseer will refuse him because he is most useful in his present position. Very nearly ninety per cent of these children are in industries in which the wages of the adult are ten dollars a week or less. In the great commercial center of New York City only five per cent of children are in positions where there is an opportunity to advance or improve.

In all forms of juvenile work for children between fourteen and sixteen the work is intermittent, — it allows for periods of rest, — and requires the attention of the child for not more than two thirds or one half the time. The operator is not called upon for consecutive labor demanding concentration, attention, and care. Such is the universal condition of juvenile labor. In none of these occupations are children engaged in running machinery. Children at this age have not the endurance, the bones are not developed sufficiently to allow of consecutive work. To illustrate: The average boy or girl of sixteen or seventeen will actually give in work at least a half-hour a day more than the average child of fourteen or younger. The child of the same age, sixteen or seventeen, will do at least five per cent more work, hour for hour, with a correspondingly less amount of waste material and damage to finished product. The work will also require less supervision, and will be of higher grade when finished.

Another important point is that the pupils who leave school between fourteen and sixteen and who nominally "go to work" are idle half the time and earn during these years not more than an average of two dollars a week. Experience shows that very few of these young people attend evening school voluntarily. At this period of life they are tired after a hard day's work, and can only be aroused by play and naturally seek the companionship of their fellow workers of their own age on the street corner or moving-picture house. The course of study of an evening school is not such as to attract, interest, and recreate tired children. Their eyes, wearied with long labor in the day, cannot endure much book work by night. Physicians confirm this experience by stating that they should not be obliged to attend evening schools.

The so-called "skilled" trades, such as the higher branches of the metal and machine trades, the building and printing trades, typewriting, stenography, millinery, dressmaking, and machine operating, do not care to receive boys and girls until they have at least reached the age of sixteen. The above trades of high grade allow for individual action, the pupils have an opportunity to study their work and make comparisons between their past experiences in school and their daily work. They also allow for the initiative and independence of the pupils and lead to a progressive development from a simple process to one requiring a higher degree of skill and intelligence.

The outcome of a boy spending these precious years in idleness and doing work which requires no thinking, and receiving no systematic training outside or inside of the mill, is that he loses the power of initiative, the habit of thinking, and all interest in his work. The same condition applies to a girl. When she reaches womanhood she has not had an opportunity to be trained in a trade and the duties of home-making. By the time they reach manhood and womanhood they know less than when they left school, and have not sufficient education to take the responsibilities attached to better positions. We find in our large cities thousands of men and women reaching the age of maturity without any training for definite positions. They crowd the employment offices seeking for positions that they cannot fill and are often referred to as the "ne'er-do-wells."

II

THE QUALITIES OF THE NE'ER-DO-WELL

Society demands that every living person should be a producer within reasonable bounds of age, health, and strength; that is, all persons of both sexes, while not incapacitated or in school, should be doing work. Practically eighty-five per cent of the present workers — those who work for pay — are engaged in producing wealth (material utilities); about five per cent are engaged in professional service; the other ten per cent are in various forms of personal service.

The life and health, and to a large extent the discipline and character, of eighty-five per cent of the working population must be derived directly from employment in the industrial and commercial fields. Any large number of men and women of limited ability out of work, as shown by the survey in Chapter I, is a heavy burden to society — and oftentimes breeds discontent that threatens the existence of our government.

What is responsible for this condition? The characteristics of childhood and youth are the same as they were years ago. The condition is due to the great changes in economic and social conditions that have been brought about by the introduction of the factory system. In old times, before the advent of the mill and factory, these boys and girls were trained by a well-defined apprenticeship on the farm, in the household, and in office and trade. Even as early as the ages of six, children were assigned tasks at home and were expected to do them.

Juvenile apprenticeship was common on the farm, where the boy, in addition to farm work, was taught to be "handy." During the winter he learned to make repairs on the barn and house, and of farm implements. During the summer he was taught how to raise and care for the plants and trees and to look after cattle. Incidentally, he learned a great deal about the sciences, such as the signs of the weather, to know trees, plants, and animals, and how to give the "first aid to the injured."

The same was true in regard to the girl, whose only occupation was home-making, who was expected to serve an apprenticeship in the home. In addition to performing the housework, she spun, wove, and knitted fabrics worn by the family. She assisted the mother in making butter, cheese, preserves, etc. She received a practical course in home-making that prepared her to take charge of a home on reaching womanhood.

The apprenticeship in the trades was carried out by a boy becoming indentured, between the ages of twelve and fourteen, to a master workman for a term of seven years. The master workman agreed to teach the boy the complete trade, which included the theory and practice; that is, a study of raw materials, processes of preparation and manufacture, shop accounts and correspondence, mathematics and drawing of the trade. In addition, the apprentice saw the necessity of continuous effort and the practice of small economies which are the basis of frugality and thrift. He learned to fit means to ends and to become ingenious and inventive. He learned that when many work together every little helps, and that only by mutual help can the best results be obtained.

The towns and cities were small and moral standards were set by men with strong religious convictions. Both boys and girls were docile and respected their elders and superiors. The result was that there were restraining influences over the young during their adolescence. The training received under the guidance of the father or master taught the boy that there was a task before every one that must be accomplished. In doing these things he learned by imitation, mechanical skill, and related knowledge. He learned to do things correctly the first time. In doing this he learned the homely old virtues, often called "good habits" to-day, such as patience, thoroughness, obedience, honesty, and thrift, that go to make up successful manhood and womanhood. Both the boys and girls had plenty of work to do so as to give them the proper physical exercise.

This was a very satisfactory method so long as the master had time to teach the apprentice, and so long as the apprentice had time to learn all about his trade. Those were the days when life was simple and competition was not keen.

Since then a great scientific advance has taken place — the practical application of science to industry — which has revolutionized industrial and economic conditions. The factory system, which is the modern application of machines and capital to manufacture on a large scale, has been developed. Men, women, and children are needed to tend the machines, and young people, who would, under ordinary conditions, have become apprentices, are attracted to the mills and factories, etc., by the large initial wage. The master workman has become so busy maintaining himself against the competition of others, and keeping up with the technical advancement of his trade, that time has failed him for the instruction of his apprentice, while the latter has found that the trade has developed to such an extent that he can no longer learn its fundamentals by mere activity in his master's workshop.

Thus, the apprentice, no longer a pupil, has become merely a hired boy, who, while making himself useful about a workshop, learns what he can by observation and practice. If he sees the interior of his master's home, it is to do some work in no way connected with his trade. In old times the master worked with his men; now he rarely works at his trade; his time is more profitably spent in seeking for customers, purchasing material, or managing his finances. The workshop is put in charge of a foreman, whose reputation and wages depend upon the amount of satisfactory work that can be produced at the least cost. He has no time to teach boys, and as there is little profit in the skilled trades for the boy between fourteen and seventeen, he is not wanted. Boys of this age are in great demand in factory work — cotton and worsted mills, etc.

The old apprentice system is not likely to be revived. The shop is no longer the training-school for craftsmanship. The workmen of the future must learn how to work by a combination of shop and school. The factory system has caused our villages to become either large industrial or commercial centers. Instead of farms or cottages with an acre or two of land attached, we have thickly settled tenement houses.

The "ne'er-do-well" child of to-day corresponds in society to the apprentice of old. He is endowed with a strong physique and an intensely practical mind. The average school does not appeal to him after reaching the sixth grade. He longs for a training corresponding to the old-fashioned apprenticeship when the boy received a practical training for life adapted to his needs. To-day he lives in a densely populated city with practically no opportunities for constructive and recreational training. In many cases the home does not furnish the proper guidance and instruction. To illustrate: all the members of the family who are above school ages, including the mother, work away from home. They go to work leaving the children in bed. About eight in the morning the children arise, get their breakfast from what is left on the table, and hurry to school with little preparation as to personal cleanliness. They spend the day and evening on the street, with the result that the dormant vicious tendencies are allowed to develop instead of being stifled by proper parental influence. These unfavorable social conditions of to-day have practically destroyed a great many homes.

III

THE TRADITIONAL SCHOOL'S FAILURE TO ADAPT

THE traditional public-school system may be compared to a ladder reaching from the primary school to the college. It has one direction — preparation for college. It is divided into sections called "grades," based upon the chronologic age of the individual. Pupils are graded in a school in order, as far as possible, to keep the mental and physical development in equilibrium. A great many children of the same chronologic age may safely be placed in the same grade in the school up to the sixth grade, — about the age of twelve. But at about this period individual children differ from each other in mental and physical development to a marked degree, and a wholesale classification has proved to be inadequate. This may be explained by studying the physical and mental development of children.

The different types of children in our school system may be illustrated by a straight line, one end of which might be called motor-minded and the other abstract-minded. The motor-minded or hand-minded child is one with a craving for achievement, to do, and not to study. He has a natural dislike for books, and finds it possible to understand abstract principles only by having an actual experience with them. The abstract-minded or book-minded child is one who has no difficulty in committing to memory abstract principles and who likes to study books. Between these two limits are shades of different types. The average child is motor-minded rather than abstract-minded.

Roughly we may divide a child's life into three periods; infancy, from birth to six; childhood, from six to twelve; adolescence, from about twelve to manhood. The infancy period is the time of life of greatest activity. Mentally the child appears to consist mostly of bundles of instincts. These instincts are the means by which the child is able to educate himself. The principal ones are locomotion, curiosity, grasping, and imitation.

The second period, childhood, is marked by less violent or more directed self-activity. Memory imagination is formed during this period. The greatest instinct is play instinct. It is both expression and means of education. During this period instincts are changed into habits.

It is a well-known fact that during the first seven or eight years of life the child is interested in objects — material things. He is educated by objective teaching. Because the memory is formed during this period the average school teacher makes a great mistake in eliminating the objective teaching which is so very prominent in the first three grades. He assumes that the average child, without having had any previous experience or contact with the experience or illustrations that lie back of them, has large power to grasp ideas, principles, abstractions given by the teacher or read out of the textbook.

While a very few children of this age have the power of committing to memory information without experience, the average boy or girl is concrete-minded rather than abstract-minded. He comes into possession or grasps new ideas and principles only by experience with (actual) concrete situations in which he sees them illustrated and applied. The child whose experience conforms to an actual commercial experience will hold the principles or ideas involved better and will be able to apply them as working principles in actual situations most effectively.

The test for promotion in our school system is a literary one. The abstract-minded child, with his quick memory, has no difficulty in passing the promotional tests, while the motor-minded child, without quick memory, fails of promotion and becomes what the teachers call a retarded pupil. A child repeating a grade feels that he is a social outcast among the pupils and loses interest in school. Then again, a child of twelve who is retarded cannot be expected to be interested in the methods of teaching and content of information adapted for a child of ten who is not retarded.

Compare the education of the boy or girl of a century ago, or the farmer's son, to that of the city boy or girl, who has no acquaintance, during this period of life when his habits are formed, except with the printed page. Very few of the schools in factory towns have manual training in the grades. The full-blooded motor-minded children have not received the education they have craved. They have little opportunity for development of the healthy exercises of the country boy or girl. It is during this period that these children fail to be aroused by mere book learning.

There can be but little question that our public-school system has been very wasteful with the material it has been working with. If there is one word in the English language which thoroughly designates the spirit of the modern age of business it is the word "efficiency." Manufacturers are not satisfied with the mere entering of raw material into the factory and the finished product leaving by another door. They desire to know the amount of waste, and are very uneasy if much raw material is wasted or placed in the scrap-heap. Waste is repugnant to us to-day. Apply the same principles of business management to our public school and we will see that the school system is only now entering upon the stage of efficiency which industry has long since adopted.

At the present time some of the progressive educational leaders are beginning to see that our school system is charged with the responsibility of preparing young people for life: that the dull child can be rescued, and that stupidity has various causes. We should account for every pupil that enters the school system.

It may be said, therefore, that while in the industrial centers of the United States we have built up at an enormous expense a colossal system of education, offering opportunity for a general education and preparation for admission to colleges and higher technical schools, we have failed to provide for the great majority of boys and girls who enter industrial life in juvenile occupations and who need education more than any other class in the community. There thus results a gap of at least two years between the public grammar-school education and the time when the pupil is ready to enter evening school. The result is that we allow the results of our educational system, so far as these children are concerned, to be very largely wasted and lost. We cease to educate in these all-important years, during which we all know that education is most needed and most valuable to our working-people.

Another great educational problem in this country to-day is the education of the so-called "foreigner" or immigrant. The United States seems to be the melting-pot for all the nations of the world. During the last ten years over a million of people have entered the United States from other lands representing not less than fifty races. They represented the poor and the unskilled of the world and as well the untaught and the illiterate. No less than a quarter of a million of immigrants, fourteen years of age or over, are entering the United States annually with no use for book, newspaper, pen, or pencil — unable to read or write any language.

The immigration problem is that of making efficient Americans out of these people, of making competent workmen and good neighbors of the unskilled and socially inefficient; for unless we succeed in doing this the chaotic mixture may upset the melting-pot.

Some may say that we have been assimilating the "foreigners" the last two generations and have not failed in the attempt. We should remember that the early immigration was essentially different from that of the present. Fewer immigrants came, and those who did come were chiefly from the west and north of Europe. The mother tongue of many of them was English, and while they had their own "settlement" or "section" of the city, they mingled readily with the Americans. To the greater part of the earlier immigrants our form of government, our manners of life, our modes of thought were not wholly strange. The English, Irish, Scotch, Welsh, Germans, French, and Scandinavians have much in common with the Americans. On the other hand, the immigrants from the east and south of Europe, who constitute the bulk of the present-day immigration, are very different. They do not speak our language, they are ignorant of our form of government, their ways of thinking and their habits of life are often very different from ours.

They settle in distinctly foreign groups, with their restaurants, clubs, coffee-houses, etc. This immigration has assisted the country in its industrial growth. Without the influx of "foreigners," we should not have had such a tremendous industrial development. But with this growth have come many social and educational problems.

Reliable statistics show that among the people of this country illiteracy is more than four times as great as in England and Scotland, where the facts are based on records of marriage licenses, and sixteen times greater than in Switzerland. The records of to-day show that, owing to the very large immigration during the last four years, the percentage of illiteracy in the United States is slowly increasing rather than decreasing.

The problem is to teach the males of the recent immigrants to become useful workers, how to speak, read, and write in English, and to lead them into intelligent American citizenship. The women should be taught English and the household arts.

These foreigners arrive here with large families and seek work at the factory gates. They cannot speak a word of English. All under sixteen are sent to the day school until they can obtain a schooling certificate — ability to read and write simple English. Those under twenty-one are obliged to attend evening schools. The adults are not obliged to attend school.

On account of the scarcity of English-speaking help, the manufacturers are obliged to hire them. They have come largely from the agricultural districts of Europe and most of them have had absolutely no experience in factory life or in running power machinery. In fact, a great many have never seen a power machine till the day they go to work in the mill.

A factory is a highly specialized organization to turn out finished products and the machines are run at a very high speed. There is little if any time to teach foreigners English. The poor, non-English-speaking operative begins work by being told in English, by the overseer, or second hand, or by some other experienced fellow countryman, what parts of the machine he is not supposed to touch. A common method of breaking in one of these foreign-born workmen is for a friend or relative of the same nationality working in the factory to speak to the overseer or foreman for him. The man is allowed to come to work in the mill with the understanding that his friend may teach him on his own job. When the new pupil gets so that he can do anything at all at the operation, he asks for a regular position or secures one in some other factory. He is a poor workman at the start, but he "knocks around" from one job to another, "stealing" sufficient knowledge, until he becomes a passable workman. This means that the factories of the present day have a great deal harder problem to handle than existed twenty years ago. The waste is increased and chances for accident have increased manyfold.

The immigrant lives in a colony where his native tongue is spoken and sees no need at first of learning ordinary English conversation. Since he works days, the only institution open to him for the instruction of English is the public evening school. This school fails to arouse the interest of the immigrant on account of its traditional methods and the kind of information imparted.

IV

THE SPECIAL NEEDS OF THIS CLASS

We have seen that the opportunities, interests, and duties of life to-day for the modern boy or girl living in an industrial community and for those that lived in rural communities of fifty years ago are not the same. Since our public-school system is the institution assigned by society to prepare our boys and girls for life, it must accordingly change, add, or modify the traditional course of study to meet these additional educational needs. This means that the school must supervise the child during the whole educational process, — when the child enters school, the training provided for him, the age at which he goes to work, the character of the work he performs, and his proper training and guidance while he is working, and until he reaches the threshold of manhood or womanhood, at eighteen or nineteen years of age.

The traditional course of study must be changed from the first to the last grade so that it will educate the whole boy and girl of this day.

Special attention should be devoted to the aptitudes of the great mass of children who are motor-minded and who must be reached through the manual and objective methods of teaching. A manual-training class should be attached to every school in this country. Children as soon as they go to school should be taught to use their hands, as the father and mother did in the rural communities a generation ago. It is very important that they should be taught when they are young. When a motor-minded pupil arrives at the age of adolescence, prevocational classes should be established so that his interest in academic work will be continued by correlating it with his vocational interests, — that is, practical work. The aim of all this will be to make every boy and girl, when he reaches the age of fourteen, know how to use his hands with some degree of skill, to be "handy" in addition to the ordinary academic work. For the majority this will not necessitate any more hours of school work. We have evidence that, by reducing the time allotted to academic work and substituting manual work, the mind is stimulated. By so doing, the child will not, as soon as the law allows, leave school with that feeling of repulsion that is so prevalent to-day.

Manufacturers find that it is necessary to employ juveniles to maintain a scale of wages adjusted to the skill required and the amount of work performed in a plant. To illustrate: If a manufacturer pays a person one dollar and twenty-five cents a day for placing empty spools on a spinning frame in place of full ones, who then rests a half-hour, it causes dissatisfaction among the other help who work continuously for one dollar and twenty-five cents a day. This is one of the important reasons why juvenile help is employed in our factories. We sometimes think that child labor is cheap and that that is the reason it is employed. Cheapness of labor is not sufficient to attain industrial success. Cheap hands must be taught, and taught well, or work in the end will cost more than that of more experienced hands who possess greater skill and have acquired more understanding of their work.

The problem before us in regard to child labor is to retain our industrial supremacy, our present industrial organization of highly specialized work, and to develop the whole boy and girl so that we may have successful men and women with industrial habits to live useful and happy lives. This cannot be done by groups of social workers in this country attempting to tear down our industrial system by forcing unjust legislation on the community, such as compulsory full-time education for children up to sixteen years of age or over. In spite of the many assertions from social leaders to the contrary, the experience of educators in this country and abroad who have made a study of education in large factory centers leads to the conclusion that it is a positive harm to retain the great mass of children between the ages of fourteen to sixteen in school on a full-time basis. These children have neither the mental equipment nor the interest to devote so much time to academic work. They have descended from ancestors who mature early in life and have intensely practical ideas, and therefore should develop useful industrial habits during the early part of adolescence.

Our social and industrial system is a growth, and we are at the present time passing through a period of change in it, the like of which has never been experienced in any equal space of time during the world's history. Any attempt to degrade our factory system, particularly the textile industry, which employs practically two thirds of the children that have left school as soon as the law allows, by saying, "It is ignorance on the part of the parents who allow the child to enter the mill or factory, and that neither power nor advantage is gained by entering the industry at an early age, and the child who does enter associates himself with our most undesirable population," is detrimental to the child and to organized industry.

All this means readjustments of our social institutions, particularly the educational system. The school and factory must work hand in hand. (The school must supplement the factory in such a way as to overcome the deadening effect of highly specialized work, and at the same time give a training that will develop the child so that when he has passed his usefulness in that juvenile work he may have the training and intelligence to enter other lines of work.)

(In order to do this effectively, we must provide for working girls and youths opportunities on a part-time system, an education which will meet with their interests and tastes, assisting each to become proficient in some line of skilled work that he may enter after passing his usefulness in the so-called "blind-alley" positions.

The educational training on a part-time basis for the boy in the so-called skilled occupations, where there are sufficient opportunities for him to remain all his life, should be for greater efficiency and civic betterment. For the boy in the so-called unskilled and factory occupations, where there is a lack of opportunity for further advancement, there should be trade training, so that he may receive during the years from fourteen to eighteen the beginning of a skilled trade, so that he may be accepted, at the end of his "dead-end" employment, into one of the skilled trades as a useful beginner.

For the girls in skilled vocations, the training must be for greater efficiency, a supplementary trade training in case of seasonable employments and a training in housekeeping. Since women have more or less to do with the home, it is doubtful if there is a more effective system of education than housekeeping. It will bring both health and happiness to the home. On account of the unsatisfactory environment of both home and neighborhood, the school must assume also the burden of looking after the physical as well as the mental development of the child. During the school session, organized games and physical exercise should be taught. In this manner it is possible to continue the interest of the child in school work, to conserve and increase his knowledge to meet daily needs. In addition, the school should follow up the boys and girls while they are working and give them helpful advice. Vocational advisers should assist and direct children in selecting vocations and while attending compulsory part-time school. Intelligent selection of an occupation is the result of intelligent preparation. We cannot expect young people to find themselves vocationally without furnishing them with raw material for thoughtful selection. Our public-school system should audit our social and industrial accounts and publish the opportunities available to young people, that they may choose their life-work scientifically, and in this way reduce our scrap-heap of unskilled labor to a minimum. "Blind-alley" jobs will then become ports of entry into more skilled and profitable positions.

V

EDUCATIONAL ADAPTATIONS ABROAD

FOREIGN nations, especially Germany, long ago recognized the need of adapting their educational system to the needs of all kinds of pupils. The average American thinks that the success of Germany is due to her low wages and long hours of work. This is not true, for, if labor is cheaper there, coal is dear, machinery dearer, and imported raw material pays a tax. The industrial supremacy of Germany is the result of definite and deliberate action. Forty years ago the German statesmen realized that the nation was inferior to the American and English in natural resources and national ingenuity. This inferiority forced upon their attention the value of thrift and of education. Thrift was multiplied by capital, and education multiplied by industrial efficiency.

America and England have served them as models of shop organization and equipment. They have imported American and English machines and tools: they have engaged the best men from the best shops of these two countries and have copied their methods of work and organization. Besides this they have devoted special attention to a matter which the United States has ignored to a great extent, the scientific or technical education of their people. The German working people are, as a class, good, steady, regular, and trustworthy. They are not so quick nor so inventive as the American, but they do what they are told to do, and do it well.

While we can obtain from the wealth of experience of Germany a great deal of practical information on how to conduct continuation schools, we must be very careful not to transplant any of the schools from Germany and expect them to meet our conditions. German industries are organized along different lines from our own, and consequently their educational needs and their workmen are quite different from those in America. The most important part of the German school system is the continuation school. This is not an outside movement grafted into the school system in an overzealous endeavor to educate the masses, but has a direct connection with the common school on the one hand and with industries on the other.

In the city of Munich practically all children are obliged to attend the elementary schools until the age of sixteen is reached. Pupils who desire to go to college leave the elementary school and enter a secondary school, or middle school, at the age of ten, and prepare there for a higher institution. If a pupil is not going to a higher institution, he remains in the elementary school till fourteen years of age. The years between fourteen and sixteen, and sometimes to eighteen, are spent in the continuation schools. For a great many years Germany maintained general continuation schools for children, but it has found that a great many pupils are not interested in general education, and these schools have been accordingly transformed into vocational continuation schools.

An examination of the German working day will show that there is very little time for evening schools. To illustrate: In the engineering works of Düsseldorf the hours are as follows: Begin work at 6.30 A.M.; breakfast, 8.15 to 8.30; dinner, 12 to 1.30 P.M.; tea, 4.15 to 4.30 P.M.; close at 6.30 P.M.; total, 12 hours, minus 2 hours for meals, equals 10 hours; or 60 hours a week.

In the Krupp Steel Works at Essen, work is begun at 6 A.M.; breakfast is from 8 to 8.15; dinner, 12 to 1.30 P.M.; tea, 4 to 4.15; close at 6 P.M., making a total of 12 hours, minus 2 hours for meals. In the cutlery works at Solingen the time allowed for breakfast and tea is longer for women and youthful workers than for grown men, giving two or three hours less of work in the week.

Note the time required for meals; it is as characteristic of the Germans as are the indifference to meals and hurry of our people. The average German workman would be unable to attend evening school with the above program. Hence, the continuation instruction must be provided some time during the hours of the working day.

Germany's continuation schools are chiefly of two types — those fitting for general education and those for the requirements of commercial life, and the needs of shops, the factories, the local industries, and the trades. The commercial schools differ from our commercial and business colleges of America in that their course in bookkeeping, stenography, typewriting, etc., cannot be taken alone. There must be added, for nearly or quite one half the course, technical instruction and business processes, including such subjects as production, markets, distribution, consumption of the product, price fluctuations, relation of exports and imports, etc.

MUNICH COMMERCIAL CONTINUATION SCHOOL

Subjects	*Hours per week*			
	Prep. class	*Class I*	*Class II*	*Class III*
Compulsory —				
Religion	1	1	1	..
Arithmetic	2	2	1	1
Theory of exchange	..	..	1	..
Bookkeeping and accounting	..	1	1	2
Commercial correspondence	2	1	1	1
Commercial geography	1	1	1	1
Commodities of commerce	..	..	..	1
Training for citizenship	1	1	1	1
Commercial regulations	..	..	..	1
Penmanship	1	1	1	..
Electives —				
Stenography		2	2 (half year)	2
Typewriting		2	2	2
Foreign languages		2	2	2
	8	14	14	14

Similarly, the technical processes and practices are added to all their industrial courses. The object of all this is to develop industrial intelligence rather than create merely mechanical skill.

In Massachusetts, while more than eighty per cent of the boys fifteen years of age have dropped out of school entirely, in Germany the practical schooling of boys fourteen to sixteen years of age begins and often continues two, three, or more years, and their attendance at particular kinds of industrial schools suited to the occupations they have selected is rigidly required. In Berlin, the model city of Germany in matters of education, fifty-five per cent of the boys between fourteen and eighteen attend such schools. Yet in America, with all its magnificent system of public schools, only one third of one per cent of all the boys and young men between fifteen and twenty-four years of age are receiving any definite instruction in the sciences and arts which bear directly on their occupation.

Recent investigations show that the average German mechanic is the best-trained workman in the world, not because he is more intelligent, but because an important part of his schooling prepares him specifically for his trade. An employer of labor and student of industrial life in America recently declared before the National Educational Association that already fifty per cent of America's skilled mechanics are educated in European countries.

The Superintendent of Schools of Munich, Dr. George Kerschensteiner, expresses very clearly the educational aim and value of the German vocational continuation schools when he says: —

> All the ripest and most valuable knowledge that we possess comes to us through our calling. Where vocational training is conceived in a thoroughgoing spirit, it offers endless opportunities for the extension of our knowledge and of our powers. A man's strongest emotions are always those connected with the attainment of the practical ends of life. If we foster such feelings in a pupil, we can win his confidence and make him take pride in his work. When once this is accomplished, we can make of him, not only an efficient hand-worker, but a good man and a useful citizen.
>
> We are brought back to the final aim of all public education, — the education of the citizen, the education of the individual, not only that he may take his place in the calling he has chosen, and that he may be able to stand independent by virtue of his work, but also that he shall contribute to the well-being of the body politic. Only through the success of all can the free development of the individual be assured.

The German Government has solved its educational problems in a more satisfactory manner than any other country. According to their scheme of education, every worker in a profession, trade, or commercial pursuit must have not only a general education, but technical preparation for the particular work selected by him. In the United States, we believe in the same policy, but apply it to those entering the professions only, disregarding the great mass — ninety-five per cent that leave school at fourteen. Germany insists that very nearly every child be under educational influence till at least the age of sixteen and often eighteen. The child leaves the common school at fourteen. He may go to work, to a higher school and prepare for college, or to a technical school. In America he may leave school at fourteen, and is not obliged to attend any other school. The Germans act on the principle, admitted by everybody who knows or cares anything about education, that the way to secure a good training for the mind is not to end the school life at the most plastic period, fourteen years of age, or, in the case of foreigners, as soon as they can pass an examination, but to insist that every boy shall spend a certain number of hours a week under educational training and sound teaching till he reaches manhood. There is less "cramming," and the instruction is slower, more thorough, more reasoned, than it can be under our American system of hurrying children through the school.

THE MUNICH VOCATIONAL CONTINUATION SCHOOL FOR MACHINIST APPRENTICES

One of the best organized continuation schools in Germany is the school for machinist apprentices in Munich. This school provides a good general education, good technical education for the machinist and good education in the rights and duties of citizenship while he is learning his trade. Attendance upon this school is obligatory for the apprentice throughout the whole period of apprenticeship. For helper and master-workman courses the school is voluntary.

The individual subjects of instruction, which are in the closest possible connection with the requirements of the machinists' trade, are as follows: Religion, trade calculations with bookkeeping, business composition and reading, the studies of life and citizenship, mechanical drawing, physics and mechanics, machinery, materials and shopwork.

The weekly period of instruction is ten hours for all classes, of which three hours come on Saturday morning, from nine to twelve o'clock, and three hours each on two working days, from nine to twelve o'clock in the morning, or from four to seven in the afternoon. The additional hour is devoted to religious instruction by a priest or other authorized official. By this arrangement of hours, as well as in the assignment of the individual classes to different week days, is rendered possible a suitable change in school attendance in the interest of the workshop management.

On account of the hours of employment no instruction is given after 7 P.M.

The subjects of instruction and hours devoted to each subject are given below: —

	Hours of instruction
Religion	1
Trade calculations and bookkeeping	1
Business composition and reading	1
Studies of life and citizenship	1
Mechanical drawing	3
Physics and mechanics	1
Machinery	1
Materials and shopwork	1
Total	10

The instruction in physics and mechanics, as well as in materials and shopwork, is undertaken by a skilled machinist; the remaining instruction is imparted by the appropriate teachers of the common and continuation schools.

The cost of instruction is defrayed by the city, which furnishes the necessary quarters for instruction. To make attendance easier, it is arranged that when possible classes shall meet in school buildings near their homes.

All metal manufacturers that are in a position to do it are pledged to support the school by giving free use of machinery, models, etc.

Apprentices who have not satisfactorily fulfilled the required school attendance can, by arrangement on the part of the master or of the school, be permitted further to attend the whole or part of the instruction of a class.

Following is a statement of the rules governing this school, together with the course of instruction: —

RULES AND COURSE OF INSTRUCTION IN THE MUNICH SCHOOL

Voluntary attendance in a class or a technical lesson is permitted to apprentices who are no longer required to attend school, and to helpers also. The fee fixed by law for such attendance in class is fifty pfennig per hour a week per year.

Those apprentices whose houses or shops lie at a great distance from their schoolhouse will receive, upon application to the board of directors of the street railway, school tickets for the half-year for the sum of two marks.

Division of subjects

The selection and arrangement of the subjects are outlined as follows: —

Calculations and bookkeeping

The first object of the instructions and calculations is to make accessible to the apprentice the necessary knowledge for a sound conduct of business and simple economical housekeeping. The second object pertains to the trade, and the instruction must gradually carry the pupil to the point where he can grasp the geometrical and similar construction calculations of machine building, and as far as possible carry them out independently. It is necessary to introduce the simplest form of equational calculations in order to obtain a clear and simple presentation of the mathematical laws of physics and mechanics. But the equations to be formed in this work are always devised from simple practical problems, and before their incorporation in lettered formulæ are to be formulated clearly and practically in corresponding equational wording. Accordingly the instruction in calculations is in the following fields: —

Class I. *a.* Common calculations — services for hours, days, weeks and months. Income book — its monthly and annual balancing. The daily, weekly, monthly and annual expenses of an individual, of a family — household book, monthly and annual closing. Economical expenditures and their illustrations.

b. Geometrical calculations — simple calculations of surfaces (four-sided) as applied to flat working material (sheet tin, plates, etc.). Computation of contents of prism-formed bodies and their weight and price calculation.

c. Equational calculations in connection with the previously mentioned geometrical problems; then also with the physical problems involved (lever, motion, velocity); final fixing of the ideas of equality and inequality; finding of individual values in an equation.

Class II. *a.* Business calculations — the buying of different metals and other materials of the industry. Rebate for cash payment, transportation, and other business expenses. Expenditures for working materials, workshops and mechanical appliances, life and fire insurance.

b. Geometrical calculations — calculation of triangles, circles, and cylinders as applied to the form and contents of round pieces of work (faucets, casks, axles, wheels, etc.). In addition, weights and cost of materials.

c. Equations. Continuation in the making-up of equations in the fields of geometrical and physical calculations (rotation, friction, heat, expansion).

CLASS III. *a.* Business arithmetic, bookkeeping, and exchange. The business books of simple bookkeeping (inventory, day and cash books and ledger), their monthly and annual closing, adjusting and balancing them, liquidations, bills of exchange, their kinds and use, bill book. In connection with bookkeeping — simple calculations of cost and estimate of expenses for things for the household and work.

b. Geometrical and equational calculations — continuation in the same kind of problems already given, but more advanced work. The cone and ball in machinery. Calculation of the weight of an object by means of the weight of the model. The right-angled triangle and the theorem of Pythagoras. The extraction of the square root. Further practice in examples from physics and mechanics.

CLASS IV. *a.* More comprehensive calculations of cost. Reason and aim of the calculations. Fixing of the cost of materials, of pay for work, from practical examples. Working expenses and their calculation based on the materials and wages. Finding of the profit in per cent.

Business composition

The instruction in composition must make the pupil capable of correctly preparing all important written communications of a private and business nature, as regards their expression, spelling, and form.

CLASS I. Ordinary letters (to members of the family, relations, and friends, about the life and business of the apprentice, also using appropriate matter from the other instruction). Business letters — inquiries, information, offers of services, application for a position, advertisements, statements of loans and refusals. Apprentice contracts. Business recommendations. General writings. Communications for publication.

CLASS II. Compositions regarding buying and work. Epistolary and published bids for wares and work, price inquiries, ordering of wares, directions for work. Purchase agreements. Business directions and instructions for delivery. Bills, receipts, partial payments, refusals of payment, grievances, excuses, judgments, and recommendations.

CLASS III. Compositions concerning debts — credit reputation, certificates of debt and citizenship, dunning letters, granting delays, remission of accounts, debts of bills of exchange. Written intercourse with officials — petitions to the magistrate, building department, manufactory inspectors, police, lower court. Reports on the local economic and social conditions, to the Department of Trade and Industry, to the Government, and to the administration.

The instruction in reading in connection with the subject of citizenship has for its object the furthering of a general and broad development of the pupil and the awakening within him of pleasure and taste in good literary productions. In so far as the reading book treats of the calling of the pupil, this matter is used in his technical instruction. The selection of the reading matter for the individual classes is left to the teacher.

The studies of life and citizenship

These branches of instruction are to give to the pupils an insight into a sane and spiritual conduct of life, and they therefore treat of the problems of hygiene as well as the problems of life in connection with the calling, society, and the state, with special consideration of those fields from which the pupil can best obtain a knowledge for the necessary unification of the interests of all conditions of people and industrial groups. The subject-matter is divided as follows: —

CLASS I. *a.* Hygiene. — The construction of the human body. Nutrition. Food and luxuries. Breathing. Circulation of the blood. Care of the skin and teeth. Dwellings and clothing. Work and recreation.

Gymnastics and exercise out of doors. The influences detrimental to health in the industry, especially the bad effects of dust. First help in the accidents of the industry. Fostering of cleanliness.

b. Deportment. — Demeanor in the house and outside, in the workshop, toward acquaintances, in school and in society.

Class II. Industrialism. — History of hand-work in general and of machine construction in particular. Beginnings in the construction of so-called machinery in ancient times (Chersiphron, Mentagenes, etc.). Significance of rotary motion for nearly all machines. Mechanical contrivances for war and conveyance in the Middle Ages. Discontinuation of the machines of the older times by the invention of the steam engine. (Papin, Newcomen-Watt, Woolf, Stephenson, Fulton). Recent engine construction (Vorsig, Hartmann, Zimmermann, Krupp, Gruson, Imperial, Germania and Vulcan dockyards). The most important engine shops of Munich. Allied industries. The present-day condition of engine-building. The most important features of the industry. The protection of designs (through patents).

Class III. Citizenship. — Communal government. Problems of communal society, its social and economic arrangements. Rights and duties of the communal citizen. Communal titular officials. The state constitution of Bavaria. Problems of state unions. Duties and rights of the citizens of the state. Titular state officials. The Bavarian state government. The constitution of the German Empire. The problems of the Empire. Social legislation. Commerce and trade in the nineteenth century and their significance for the well-being of the citizen and industrialists. The value of German consuls in foreign countries.

Class IV. The citizen of the state in public life. — Human society — the social and economic distinctions in it, their origin, necessity, and present development. General social and political economic systems (legislation, administration of rights, security, culture, and public safety). The part taken by the citizen of the state in the advancement of the common interests of life. The advantage of life under a united states government. Germany's economic and cultural position in the world. Supplementations of industrial legal knowledge, especially legal instruction for conducting factories, steam plants, and such mechanical systems. Accident insurance.

Mechanical drawing

The object of this instruction is to give the pupil a certain amount of training in the use of drawing instruments and in addition the capability of following out working drawings without difficulty. The pupil must also learn to make a dimensional sketch of any part of a machine, from which work can be done or a working drawing made.

Special value is attached to exercising the pupil in the correct statement of the necessary measurements.

Then follows free-hand sketching.

Distribution over the four years

The subject-matter is distributed over the four years as follows: —

Class I. Instruction in the use of the ruler, angle, and circle. Copying of measurements (fluted metal plates, perforated metal plates). Division of distances, angles, and circles. Hexagons (receiving nut, ratchet wheel). Contact between straight lines and circles; and between two circles, the one with the other (screw pegs, plates, flanges, stock stands). The most important curves. Chain links. Representing of materials by colors and by cross-hatching (section of rolled iron).

Class II. The representation usual in the machine industry, in ground plan, vertical section and in necessary cases in profile. Sketches of simple models giving special consideration to the substance. Making of drawings from sketches. (Models for this — simple pieces composed of rolled iron, plates, slides and guide pieces; rivet bolts.) Representation in section. Continuation of the drawing of models (covers, packing-box spectacles and cases, anchor plates, pieces of tubing, store scales, foundation plates, smelting hearth, sliding pieces, axles and shafts, bolts and pins). Treated surfaces.

Class III. Plane sections, triangle prisms, cylinders, cones with their development. The most important curves and their construction — transition curves in rounding out (smoothing irregularities). Curves between turned and plane surfaces (cross-pieces, piston-rod heads, rod ends, receiving nuts). Penetration of two cylinders with developments. Representation of normal screws. Screw joints. Rivets and rivet joints. Drawing of more difficult models (valves and cock boxes, cross-head, forms of lever and piston rods, guiding appliances, regulator arms, etc.).

Class IV. More difficult model drawing according to proportions of the given model; for the continued development by the brazier. The drawing of separate objects and larger working drawings.

Physics, mechanics, and descriptive machinery

In this instruction the pupil must be familiarized with the working of the most important natural laws, with continual reference to their practical application. The instruction in descriptive machinery shows the pupil the important apparatus and the chief machines, both as to arrangement and method of action with reference to the applied physical laws.

Class I. Motion — uniform straight-lined motion. Velocity — motion in a circle. Transformation by rim driving and cogwheels. Transformation conditions for the turning lathe; connecting gear. Screw-cutting on the turning lathe. Force; its representation by drawings. Composition and resolution of forces; parallelogram of forces. Moment of force, superimposed pressure. Work, effect. Simple machines — lever, wheel and axle, pulley, movement along a surface, inclined plane, screw, worm wheel, force, mass energy, centrifugal force. Friction.

Class II. Qualities of rigid bodies. — Molecule and atom. Cohesion, elasticity. Principles of tensile strength, resistance to compression and shearing strength. Qualities of fluids. Horizontal surfaces; hydrostatics. Transmission of pressure; hydraulic press. Bottom and side pressure. Outflow, buoyancy and floating. Qualities of gas. Expansive force and tension. Law of Mariotte. Air pump. Expansion air balloon. Heat. Expansion of bodies. Melting point. Evaporation, vaporization, boiling. Boiling point. Saturation and superheated steam. Amount of heat. Caloric — specific heat. Heat of melting, heat of vaporization, quantities of heat.

Class III. Grouping of the units of machine construction and the means of measuring them. Measures of length. Vernier, sliding gauge, calipers, measurements of cavity and depth, vacuum, calibrating rods and rings (tolerated exhaust). Determination of weight (usual scales, quick scales, platform scales, spring scales). Determination of times of revolution and velocities (cyclometer, tachometer). Measure of tension (fluid and spring manometer). Determination of amount of work (Prong's dynamometer and brake experiments).

Class IV. The steam engine; the actions within the cylinder and their representation by drawings. Diagram and indicator. The steam distributer. Aim and arrangement of condensation. Arrangement of the steam engine. The most important features of the steam boiler. Motors actuated by explosions with and without special arrangement for ignition. Regulation of water power and its employment to advantage.

Materials and work

It is the function of the instructors to familiarize the pupil with materials used in his trade, their source, how they are obtained, their qualities and how they are worked, and to introduce to him the most important working appliances and methods of work.

Class III. Iron — source, method of obtaining it, its qualities and how it is worked. Blast furnace — pig iron, cast iron, and malleable iron. Ingot iron and forged iron. Ingot steel and forged steel. Finery process — puddling, Siemens-Martin process, Bessemer process. Conversion into steel and tempering. Casting, forging, rolling, and drawing with the appliances pertaining thereto. The fuel — hard coal, charcoal, gas.

Class IV. Copper, tin, zinc, lead, nickel, aluminum as regards their occurrence, obtainance, characteristics, and working up. The most important alloys as regards composition, characteristics, and working up. The chief working tools and working tool machinery. Grinding, cleaning, corroding, etching. Mention of typical objects of manufacture in the line of progressive development.

It is in these continuation schools that those who are to form the rank and file of the metal trades receive their training.

EDUCATIONAL ADAPTATIONS ABROAD

TRAINING GIRLS TO BE GOOD HOUSEKEEPERS IN BELGIUM

Belgium has the honor of establishing the first school in household arts for girls and women. As a result, Belgium could probably boast, prior to the war if not to-day, of offering the best facilities that the world knows for the training of young women for the duties of the house. While the institutions that provide this sort of training were established by private associations, they were soon brought under government inspection, so that in every large center in Belgium one could find an excellent school under government supervision, housed in a splendid building, offering both day and evening courses to meet the varied needs of women.

The development of these schools began about thirty years ago as a result of the tremendous evolution of industry and the rapidly increasing number of girls participating in hand and factory labor. It was found that the young woman entered the workshop or factory immediately upon completion of her compulsory education in the common schools. She had, therefore, no opportunity of adapting herself to household duties, nor of acquiring the domestic virtues which would be necessary to her when, in her turn, she should marry and have a new home. Not only was the opportunity wanting, but there was no inclination.

Training girls in household subjects in Belgium begins at six years of age. It is restricted to needlework.

The reason that housewifery instruction is not given is because the children in the primary grades are too young to do practical work; what they can do is little more than play. Then again, young children do not know the value of money, and when you speak to them of the cost of a certain article they do not understand or know the value of the same.

Needlework instruction in primary schools aims chiefly at practical results, and by practical is meant everything which is applicable in the homes of workingmen, laborers, and small tradesmen. Thus, for instance, great attention is paid to the making and mending of ordinary garments, and fancy work is taught when useful kinds of sewing have been mastered, and then it consists principally of trimming for linen and clothes. While the pupils are taught only work adapted to their practical needs, to the conditions in which, presumably, they will have to live, an attempt is made to form their taste, and to show them that simplicity favors, rather than excludes, elegance; no luxury in the way of bought ornaments, even of small cost, is allowed.

Needlework is taught to the whole class simultaneously, with individual correction. The teacher herself generally institutes her own methods of instruction; as a rule, the first step consists in inductive explanations and demonstrations before the pupils. The teacher does everything on a large scale so that all the children may see. The knitting stitch in the lower standard, for instance, will be shown with large wooden needles, and with thick wool of two colors, used alternately for each row of stitches, so that each stitch is distinguishable. This is followed by an examination of knitted articles — stockings, for example. In a similar way, in sewing the different stitches will be first demonstrated on canvas upon a frame, with a big needle, and thick colored thread. The learning of each stitch is followed by practical applications, at first simple and then more advanced; the latter combine two or more different stitches. When pieces of work are too difficult for the pupils of the lower standard to finish, they are handed over to the pupils of the middle or the upper standard, in order to teach the girls to help each other. Cuffs, for instance, are sometimes finished with crochet-work by the pupils of the middle class, and children's petticoats knitted in strips in the middle standard are joined and put into a waist-band by the pupils of the upper classes.

In the upper classes, where cutting is taken up, measurements are taken by one pupil from another before the whole class. The pattern is drawn and cut out in paper and afterward in the material, having been first studied in the made-up article. Then comes the necessary tacking together, fitting, correcting, and making up. The lessons in cutting out are accompanied by talks on raw materials, the choice of materials from the point of view of price, usefulness, taste, and their hygienic properties. The teachers also make technological collections (cotton industry, wool industry) and collections of patterns.

All the work done by the pupils is in real sizes and not on a reduced scale. As far as possible, articles are chosen which can be used by the girls themselves. It is hoped that this will help the pupils to realize the usefulness of needlework, and that the pleasure they take in it will develop their taste for manual occupations.

The necessary materials — thread, wool, knitting and sewing needles, and material — are supplied gratis by the commercial council (in the case of private schools, by the friends of the schools) to pupils who receive free instruction, at the rate of one to one and a half francs per pupil. In some places the pupils are given all the articles which they make themselves; in others, the articles, at the end of the year or at the beginning of winter, are distributed to the neediest children in the school.

At every favorable opportunity the subjects of other lessons are chosen so as to recall or enforce the principles taught in the needlework lessons. In arithmetic, for instance, in the lower standard the pupils calculate the cost of the work that has been done (the wool used for the cuffs, etc.); in the middle classes they are taught beforehand the cost of the materials necessary for work; in the upper classes they have similar but more difficult exercises. Subjects bearing on needlework will be chosen for reading, writing, dictation lessons: for instance, the usefulness and the pleasure of needlework, a résumé of what has been learned, good taste, and simplicity in dress.

Drawing, in girls' schools, is taught with especial reference to needlework, principally in the middle and upper classes; patterns for various garments, collars, aprons, chemises, bodices, etc.; representations of the various kinds of drawing and patching; and lessons on the choice of colors for embroidery, dress materials, etc.

The following is the model course laid down for needlework: —

Lower classes

1. Knitting a band or garter (two needles); study of the stitches; stitches on the right side; stitches on the wrong side; edges; increasing and decreasing; how to cast on stitches.
2. Knitting (four needles); cuffs.
3. Socks; study of relative proportions; casting on and knitting.

Middle classes (recapitulation of the preceding course)

1. Knitting stockings; study of the relative proportions; drawing a stocking, and its different parts in their relative proportions; casting on and knitting; how to measure the stocking in course of making; how to strengthen the heel.
2. Study of cross-stitch on canvas; letters and numbers.
3. Elements of sewing — running, hemming, backstitching, overcasting, seam, hem, French double seam, oversewing, selvedge, oversewing folded edge.
4. Making simple and easy articles — towels, napkins, handkerchiefs, aprons, women's chemises and patching.

Upper classes (recapitulation of the preceding courses)

1. Knitting a vest; mittens.
2. Marking linen; letters and numbers.

3. Stitching; gathers; buttonholes; and eyelet holes.
4. Mending garments; simple darning, and darning according to the web of stockings; patching linen and garments; fine darning on linen and table linen.
5. Cutting out and making easy garments, especially chemises and bodices.

Fancy work, crochet, embroidery, tapestry work, etc., should only be taught to the pupils who have mastered useful sewing.

The syllabus is arranged in six school years. Three hours a week are devoted to needlework during the first five school years, and three and one half hours during the sixth school year. The first and simplest sewing stitches are taught from the first year onward; every year revision is made of the stitches already learned.

Raw materials are furnished at the rate of thirty-eight cents per pupil. All of the apparatus necessary for instruction — such as models, charts, frames, large wooden needles, thick wool — are furnished by the consumers and are occasionally supplemented by the teacher. The needlework lessons are given to all the class, together with individual help and correction. The instruction is given methodically, so as to be as inductive as possible, and to appeal to the pupils' intelligence.

The people of Belgium are far ahead of Americans in their observance of the "penny saved and penny earned theory." They use for their salads the parts of the vegetables which we throw away. They toast the "left-over" slices of bread which we let mould. They prepare, from the common and healthful vegetables which we scorn, dishes fit for epicures. And they do these things because they have been trained, from early childhood in housekeeping schools, to believe that thrift is imperative. As a result, they have good health, happiness, bank accounts, and financial ability which is rare among the plain people of America.

England faced this great educational problem of part-time instruction years ago. A half-time system was introduced, in 1833, by the Commission on the Employment of Young Persons in Factories, to prevent overwork and under-education. The success of this scheme is shown by the report of the late Commission on Technical Education, which states: —

> Half-time children of the great manufacturing [factory] town of Keighley, England, numbering from fifteen hundred to two thousand, although they receive less than fourteen hours of instruction per week and are required to attend the factory for twenty-eight hours in addition, obtain at the examinations a higher percentage of passes than the average of children throughout the whole country receiving double the amount of schooling.

Recent reports from the English district factory inspectors show, in one factory district in

England, where thirty-five children attended school two and one half hours daily and worked in the mill five hours, with a complete rest every alternate week after 3 P.M., and from Friday until 9 A.M. the following Monday, that the half-time children were bright, healthy, and presenting an intelligent appearance.

The inspector of schools found that the "half-timers" made as much progress in their education as did the full-time scholars, and invariably earned the full government grant which depends both on attendance and scholarship. They are necessarily very regular in their school attendance, because lost attendance has to be made up before they can renew work in the mill. The fact that they earned $1.10 a week probably accounted for their being better fed and clothed than our children of the same class.

Mill managers of the high-grade textile industry, worsted trade, in England state that, after all allowances have been made, a boy or girl trained as a half-timer is as bright as the normal full-timer. Of course, mill managers naturally prefer full-timers, as they are more easily controlled and organized. The part-time schooling in England is not very efficient, because it is of a general continuation-school type and fails to appeal to a great many pupils, nevertheless, it is better than full-time schooling or full-time work for many pupils.

Similar experiences in different parts of England and on the Continent show that the long-time system (all-day schooling) and the omission of industrial work are in violation of the laws of physiology.

In Edinburgh, Scotland, there is a vital connection between the school and employment departments. In the same building with adjacent offices are the directors of the continuation schools and the employment bureau. They find positions for young people between the ages of fourteen and sixteen who are going to work. The director of the continuation schools has information as regards the mental and physical development of every child and the kind of work they desire, and the employment agency, on the other hand, has a list of positions and opportunities open to young people. The two departments work together in the interest of the child and the employer.

VI

SOME AMERICAN EXPERIMENTS

During the last few years a large number of investigations or surveys have been made in the large cities of this country to obtain data upon which to make intelligent experiments along educational lines, particularly vocational education. The value of these surveys is found in the suggestions which they offer to other cities and towns interested in providing practical education for their people. Since it is necessary to experiment in education as in other lines in order to make progress, we should be careful to experiment intelligently and profit by the experiments of other communities.

The last survey, during the year 1915, has been carried on in the city of Minneapolis under the direction of Mr. Charles A. Prosser and the National Society for the Promotion of Industrial Education, for the purpose of determining just what kinds of industrial training are required to meet the needs of Minneapolis.

Three recent causes led directly to the survey:

(1) The enforcement of the compulsory education law; (2) the enactment of a minimum wage law for women; (3) the establishment of the Dunwoody Institute by the bequest of five million dollars for industrial education, by the late William Hood Dunwoody, a wealthy Minneapolis flour manufacturer. The Dunwoody Institute was founded to give free instruction in the industrial and mechanical arts to the youth of Minneapolis and Minnesota.

Before undertaking to put into effect in a comprehensive way the provisions of the will and the city's plans for industrial education, it was decided to obtain complete information on the subject; so that Minneapolis has excellent facilities for becoming the laboratory of the country on vocational education.

The main questions dealt with in the survey are: —

1. To what extent is there a need for vocational training in Minneapolis?
2. To what extent are the public schools, private agencies and apprenticeship systems meeting the need?
3. What kinds of vocational education are needed?
4. How can coöperation be arranged between the schools and the trades and industries?

A thorough study was made of all the industries in the community to determine the following questions: —

1. Whether there is a content of technical knowledge or skill in any job that cannot be acquired through routine work for which special instruction is needed.
2. If so, what is it?
3. Whether it can best be imparted by provisions inside the industry.
4. If not, whether it is worth while to provide for such instruction through outside agencies.
5. If this is true, whether such instruction shall take the form of
   - *a.* All-day industrial schools.
   - *b.* Trade schools.
   - *c.* Part-time industrial classes.
   - *d.* Evening classes.
6. Whether there are any jobs for which it is not desirable either to direct the youth or to train him at public expense.
7. What number of new workers could be prepared for any job, if it has a teachable content, without overstocking the market?
8. What kind of equipment as to age and physical and mental assets the worker should have for the job?
9. To what extent does the industry select its workers for any job so as to secure those best adapted to it?

The answers to the above questions show Minneapolis the types and extent of the schools needed, the courses of study to be followed in their schools, and the equipment and try-out necessary to carry out the aims and purposes.

It is coming to be recognized that in some industries the training of the worker should be as much a matter of trade agreements as hours of labor, scales of wages, grievance boards, and other matters which ultimately and vitally concern both the employer and the employee. These are dealt with by means of a joint agreement known as the "Protocol." The survey in Minneapolis has worked out in a complete form, in connection with courses given at the Dunwoody Industrial Institute, trade agreements covering the following: —

1. The conditions under which the new workers are to be trained and received into the trade or occupation.
2. The credit toward the period of apprenticeship to be given any course of training in the school either before or after employment.
3. The training in schools as well as shop to be required of the apprentices after employment.
4. The preference given to local and trained

workers in hiring and promoting in the trade and occupations.

5. Possibilities and arrangements for instruction during the dull-season periods of trades.

As a result of this survey all-day, part-time, dull-season, and evening classes have been formed. Since Minneapolis has committed itself to compulsory full-time education for all children less than sixteen years of age who have not graduated from the grammar school, it precludes also the use of compulsory continuation schools for employed children less than sixteen years. Effective prevocational classes and manual training with vocational direction have been introduced in the grades to hold the interest of the motor-minded children from twelve to sixteen years of age.

Other communities have conducted interesting experiments along educational lines for the neglected boy and girl, who cannot profit by the existing traditional public-school instruction. No one community is meeting all the educational needs of this group.

Chicago has introduced hand-work in all the elementary grades from the kindergarten to the high school. The children are made familiar with ordinary industrial processes of a limited range and with the materials that enter into the work.

In addition to full-time evening and prevocational classes arrangements have been made with the unions and employers to have continuation classes for apprentices: —

Agreement between Carpenters' District Council and Carpenter Contractors' Association: This involves about two hundred and forty apprentices at the present time. The apprentices attend school during January, February, and March and are paid their regular apprentice wages.

Agreement between the International Brotherhood of Electrical Workers, Local 134, and the Electrical Contractors' Association: This involves at the present time only about eighty apprentices, but in normal times one hundred and forty to one hundred and fifty. The apprentices attend school one morning each week without loss of pay.

Agreement between the Journeymen Plumbers' Association and the Master Plumbers: This involves about one hundred and forty apprentices at the present time. The apprentices attend school one morning each week without loss of pay.

About thirty machinists are attending the Crane School one morning each week, but this is not by agreement between the union and employers. In these cases the employers grant the apprentices a half-day's time to attend school without loss of pay.

By arrangement of the Chicago Retail Druggists' Association many apprentices in pharmacy are permitted to attend school for part of each day to earn their credits for admission to schools of pharmacy. This arrangement went into effect February 1, 1915.

The New York City School System is conducting some very interesting experiments in prevocational training in the elementary schools under Associate Superintendent William L. Ettinger and in part-time education under Associate Superintendent John H. Haaren.

The plan of the prevocational training is as follows: Pupils in the seventh- and eighth-grade classes are allowed to select a prevocational course which includes two groups of studies — the academic and the shopwork. The first includes the essentials of English, arithmetic, science, history, and geography. The second includes the theory and practice of mechanical drawing, freehand drawing, electric wiring, garment design, joinery, sheet-metal work, machine-shop practice, printing, plumbing, and sign-painting.

The time allotment during the week is as follows: —

Total time	35 hours
Shop time	15 hours
Academic time	20 hours
English	5 hours
Arithmetic	3 hours
History, geography	2 hours
Science	2 hours
Physical training, hygiene	5 hours
Related drawing	3 hours

The academic material is correlated with the shop subjects and shop instruction. In order to do this effectively the academic instructors spend one hour daily in the shops consulting the teacher and pupils so that he is able to talk intelligently in the class work about the shop instruction. Pupils receive samples of different kinds of industrial work during the two years. The afternoons during the first nine weeks are devoted to machine work. Pupils showing unusually marked ability in the trade may continue in this branch, while those who show that they are not proficient, change to electric wiring the second term of nine weeks. This scheme is continued every nine weeks in woodworking, sheet-metal work, commercial subjects, etc., until the pupil has found the trade that he is best adapted to follow.

Superintendent Randall, of Cincinnati, is conducting some interesting experiments in vocational guidance. Definite instruction in vocational guidance is given in the grades. Coöperation between the manual-training and academic teachers has done a great deal to accomplish this purpose.

The City of Boston, under the direction of E. Stanwood Field and Deputy Commissioner Robert O. Small, of the Massachusetts State Board of Education, has organized compulsory continuation schools for minors between the ages of fourteen and sixteen years. These continuation schools are divided into three groups — general improvement, prevocational, and vocational continuation schools.

VII

A CONSTRUCTIVE PROGRAM

EVERY community should provide an effective system of day continuation schools for pupils, between the ages of fourteen and sixteen, who are either obliged to leave school for economic reasons or who leave because they are not interested in existing school work. Experience shows that few pupils are willing to attend voluntary continuation classes; therefore it is necessary to make attendance at these schools compulsory. These classes should be from not less then four hours a week to a half-time basis.

The organization of compulsory continuation schools should meet the educational needs of all young people. Therefore it is necessary to have three types of schools: —

1. General continuation classes for pupils who have left school for economic reasons and who desire to continue their general education. These are often spoken of as "general improvement" classes. The methods of instruction and content of information closely resemble those of the regular school. Since most pupils reach the sixth

grade by the time they are fourteen years of age, most of the instruction should begin at that grade. A distinct class should be formed for those who are ambitious to attend some higher institution of learning. The only exception is in case of the foreign-born child who entered the regular schools over age and left as soon as he met the requirements of the law — ability to read and write simple English. Special ungraded classes may be formed for this group.

2. Prevocational continuation classes for pupils who have left the grades and who are working in "blind-alley" positions; also for pupils who do not know the character of work they are best fitted to pursue, and who therefore require samples of different forms of commercial and industrial work so that they will have an opportunity to measure their abilities and aptitudes against the practical demands of the different callings. The prevocational opportunities may be divided into two groups — those fitting for the requirements of commercial life, and those directly planned to meet the needs of shops, factories, and local trades.

3. Vocational continuation classes are for pupils who know definitely the kind of vocational work they desire, or are in a skilled trade, or are

in an occupation that does not furnish preparation for skilled employment. Since the skilled trades do not, as a rule, care to employ juveniles under sixteen, the number attending these classes from skilled trades will be small.

The impracticability of teaching a large number of trades in a continuation school, such as would be necessary to meet the educational needs of all pupils between fourteen and sixteen, is evident to all. The average vocational continuation school teaches five or six trades, such as the trades of machinists, electricians, woodworkers, and the building trades. As a matter of fact, there are over two hundred and seventy industries in the State of Massachusetts, which is a typical industrial community. The average vocational continuation school, if developed in every urban community, would in a short time flood the market with student mechanics of a few trades. This would be detrimental to all concerned — community, citizens, and manufacturers.

Then again, experience shows that in a vocational school where work is not carried on under conditions of a real factory, it is almost impossible for a pupil to attain a practical skill and efficiency equal to that of a good workman in the factory. The economical methods of production, particularly the workman's time as a factor in the cost of production, can never be sufficiently demonstrated to a pupil in a mere school where his wages do not depend upon his actual productive ability. Then again, the skill required for a commercial product cannot be understood by a boy until his product is put to actual commercial use and until he sees an incentive in the form of wages for his judgment and skill in producing it. Wherever it is possible, the factory or shop and continuation school should coöperate, so that the shop practice shall be given in the shop or factory and the related technical and academic subjects shall be given in the school. This may be done by having the manufacturers set aside a certain portion of a factory plant for the training of apprentices on commercial work. One of the great difficulties in making arrangements on less than half-time — one week at school, and the other at work — is the difficulty in arranging shifts. In large factories, such as cotton mills, it is possible to increase the force of juvenile workers one thirteenth, and then allow one thirteenth of the group out one morning or afternoon during the week. This would allow for four hours' instruction a week. Two half days would allow for eight hours a week. In this manner it is possible to have the full quota of workers in the mill all the time.

A factory school, in order to be efficient, must be well equipped and the equipment kept up to date. A commercial product must be used. This means a large expenditure of money and a large cost for maintenance and raw materials. While the school may receive some revenue from the sale of products, nevertheless, the school cannot buy raw materials or sell its products at an advantage. Then again, a shop has a peculiar shop spirit among its workers that can be obtained only by actual experience in the shop.

It is clear that the most effective and efficient method of training young people for trade work is by combining in some way actual shop experience with theoretical knowledge in the school. In this way one obtains the actual skill by participating in a commercial shop on a commercial article under commercial conditions. Then the theory or related knowledge may be obtained in a school. In order to have a school that will be in the interest of the boy as well as of the manufacturers it is necessary that the public-school authorities — school committee or some committee representing the public — and the manufacturers enter into a partnership.

The practice shops in the factories should not be exclusively in the control of the manufacturers, nor should the theoretical instruction in the schools be exclusively in the control of the school committees. Both shop and school should be controlled by a committee composed of representatives of the various interests involved. It has been suggested, as in the city of Beverly, that five members of the school committee, the mayor, and one representative of the manufacturer furnishing the practice shop should constitute the Committee on Industrial Education, and that the superintendent of schools should be, *ex officio*, secretary and executive officer. The Committee on Industrial Education would then have full charge of the school and shop and of all matters pertaining to the same. The manufacturer furnishing the practice shop would reserve the right to withdraw his coöperation upon suitable notice in case he is dissatisfied with the management of the shop.

The terms on which a manufacturer would coöperate in furnishing a practice shop would be an agreement that the manufacturer would furnish the necessary floor space, power, heat, and light, and the machinery and tools necessary for the equipment. This shop would be operated, so far as accounting is concerned, as a separate factory. The manufacturer would furnish the raw materials and drawings for the work to be performed and would purchase at established prices all finished products that passed inspection and were accepted. One half the piece-price for the product would be paid to the pupil performing the labor and the other half would be devoted to maintenance. In the accounts, the practice shop would be debited for the cost of maintenance, including raw materials and instruction, and would be credited with the full value of all productions, and if, in any case, the accounts showed any profit, such profits would be devoted to the support of the school. It is hardly to be supposed, however, that the earnings of the shop would ever even approximate the cost of maintenance. The manufacturer could in no case receive any profits from the labor of the pupils in the school and the pupils would in no way compete with regular employees in the factory.

Vocational education for girls and women is as important as vocational education for boys and men. Statistics show that eighty per cent of girls will eventually marry and become housekeepers. The others will have more or less to do with the home. The problem is to give them a vocational training so that they can find a position as soon as they leave school, and at the same time to prepare them for the home.

Experience shows that vocational education for girls and women is very different from that of men and boys. The incentive that makes a boy or young man strive for vocational education is the very thing that causes girls not to be impressed with the need of greater efficiency in trade work. The young man enters upon industry for his life-work, and he wants a training that will advance him and give him a permanent occupation. A great many girls, on the other hand, expect to marry, and are going into industry for a short time until they are married. They know that the opportunities for advancement are very limited, and therefore desire a simple form of instruction and training to obtain skilled positions and at the same time be prepared to be homemakers.

Since the aim of a continuation school is different from the regular public schools, it should be conducted in a separate building under an independent administrative officer and faculty. The methods of teaching, content of information, standards of discipline, and scholarship should be somewhat different from those of the regular school. The school should be in session between the hours of eight and five, five days a week throughout the year.

The time allotments for general continuation, or prevocational continuation, and for vocational continuation schools have been worked out by the State of Massachusetts as follows:—

General Continuation School

	Total time (per cent)
Specific training — English, arithmetic, geography, and history	50
Discovering and cultivating native interests and powers	25
Testing capacity in some manual work, vocational information, civics, hygiene, recreation and cultural studies	25

Prevocational Continuation School

Shop work — samples of industrial or household arts	50
Information relating to the industry obtained from books, excursions	25
Civics, hygiene, recreation and cultural courses	25

Vocational Continuation School

Trade work — related trade work on the processes of production, distribution, and consumption	25
Civics, hygiene, recreation and cultural courses	25

Classes of instructors

It is necessary, in order to conduct all-day prevocational or continuation classes efficiently, to have four classes of instructors: —

The principal, or supervisor, who is the administrative officer of the school.

The trade teacher, who should have at least an education equivalent to that of the grammar school and five years' successful experience as a tradesman.

Technical teachers or teachers of related subjects, such as vocational science, vocational mathematics, drawing, etc., who should have an education of at least two years above that of the high school in technical branches. In addition he should have an appreciative knowledge of trade conditions and a sympathetic attitude toward children of limited ability.

An academic teacher, who should have a general education of at least two years above that of the high school. In addition he should have an appreciative knowledge of industrial conditions and a genuine interest in mechanical subjects and apprentices.

English

Every pupil in a continuation school should receive instruction in written and oral English. In the liberal continuation school literature for appreciation should be offered. In addition, class exercises should include debating, argument, writing reports and compositions. Spelling, punctuation, and the use of the dictionary should be taught in connection with the regular work.

Other subjects, such as history, geography, and drawing, may be taught in an unorganized manner — as the occasion rises — as well as in organized courses.

Hygiene should be taught in an intensely practical way, such as information with reference to occupational diseases, safety appliances, first aid to the injured, and personal hygiene.

Since the child should be under educational influence until he reaches adult life, — eighteen or nineteen years of age, — provision must be made for voluntary attendance at the continuation school until that time. With the reduced length of a working day in most places in this country from twelve hours to ten, to nine, and then to eight hours, it is not unreasonable to ask young people to attend evening continuation schools, of the type described above, from four to six hours a week. In fact, attending evening schools would teach young people how to use their leisure time. A young person's success or failure depends upon his use of his leisure.

The evening continuation school would embrace the courses given in the regular evening elementary and evening high schools. The elementary continuation school provides instruction for young people who have not graduated from the grammar school, or who have received an education equivalent to the eighth grade, and for the non-English-speaking pupils. An evening elementary school may be organized in the interest of efficiency and economy into three departments: First, those classes in which English-speaking pupils are taking strictly academic work; second, those classes in which the pupils' primary aim is to learn to speak English; third, those special classes that may be authorized to meet distinct local needs, like dressmaking, cooking, embroidery, and a special class for laborers in civil-service work.

The advanced evening continuation-school classes may be divided into two groups: First, those adapted to meet a demand of those deficient in early education who are desirous of making up this deficiency (general continuation classes); second, those classes which supplement acquired skill with technical training that will lead to advancement and increased earning power (vocational continuation classes).

Experience shows that few adults desire to do regular organized academic work. Therefore, the academic classes should not be planned for adults, but rather for young people who have recently left school for economic reasons, or for the day continuation classes and for those who desire the elements of a grammar- and high-school education. It is possible with young people to have a definite course with subjects in logical sequence, such as arithmetic before algebra, etc.

For those who have completed the grammar-school course or its equivalent, a three-year course in high-school subjects should be offered. Each pupil should take three subjects three or four times a week during the year, including English.

The best educational results are obtained by taking three subjects an evening. Great stress should be laid upon the fact that without a command of language a person is handicapped in life. Pupils should be encouraged to take the three-year course in English composition and literature. This course should lay great emphasis on business English. Latin, French, Spanish, and German should be offered to students who have the ability to pursue them or may require them for entrance to other institutions. It may not be necessary to offer all the languages every year. Some languages, like Spanish and German, might be offered in alternate years. The same is true in mathematics. A great many of our leading young men have received sufficient training in an evening school to go to college. Students should be encouraged to take books home and to do considerable outside studying.

After the pupil has completed the academic branches, opportunity should be provided to take up the special course in technical and commercial branches. Importance should be attached to the fact that the time for pupils to study academic branches is before eighteen years of age. After that period pupils desire to concentrate their attention on one or two related subjects. The idea in mind should be to provide instruction of a liberal kind in an interesting manner so that boys and girls may receive the elements of a high-school education.

The prevocational and vocational evening continuation schools would constitute the regular training that is usually given in the evening homemaking, commercial, and trade classes.

The most ambitious workers in every industry desire to obtain a practical education that will advance them in their vocations. The extraordinary success of the correspondence school in large cities is another indication of the desire of the many workmen to improve themselves in their general vocations. Over sixteen hundred students were enrolled in these schools from one city of one hundred thousand inhabitants. The disadvantages of instruction by correspondence are many, but such instruction is better than none at all. There are thousands of men in every community intellectually incapable of benefiting by this course. Not more than three in one hundred complete their course; in fact, the International Correspondence School admitted, in an article published a few years ago in the *American Machinist*, that but 2.6 per cent of their students have been awarded a certificate or diploma. The vast majority of men enrolling are soon discouraged and frequently lose faith in their work.

Evening vocational classes, in order to be most effective, must be planned and organized on different lines from the day technical classes.

This is due to several reasons. The average length of a boy's school life until recently was four years, and that was before he was twelve years of age; consequently those boys who are now industrial workers have received little more education than that obtained during these four years. Before this time the shop and mill were training schools for workers.

When these same boys, later in life, attend evening school, they remember very little of the academic work they have received earlier in life. In addition they are tired after a hard day's work, and have, therefore, an intensely practical aim in view in attending school, and are unwilling to study systematically an entire subject, as might be expected with young people in a day school. They demand that the instruction shall lead directly to the specific things they want to know. If they are obliged to spend a month or more on preliminary work, the value of which they do not immediately discover, they will soon become discouraged and leave.

Then again, mechanics and other tradesmen who may, perhaps, have some reputation in their trades, and who wish to perfect themselves in certain technical lines, do not wish to be grouped with younger persons, feeling that such persons, having come recently from the public schools, are able to answer questions, use better English, and appear to better advantage than they do. In other words, adults are often sensitive about the comparisons which the younger members of the class are apt to make at their expense.

Every worker attends an evening technical class to satisfy a definite need. To illustrate: A young apprentice in a machine shop finds difficulty in reading a blue-print. He enrolls in an evening drawing class in order to learn how to read a blue-print. The teacher is a mechanical draftsman, and he thinks the best way to know how to read a blue-print is to be able to make one. The young man is taught lettering, how to draw straight and curved lines and to make simple drawings. The young man's fingers are hardened from rough work, and he finds it difficult to manipulate the fine drawing instruments. During all this time he is receiving in his daily work the same reprimands, and is therefore debating in his own mind the value of the drawing course. It is undoubtedly true that the drawing course this teacher outlined is a valuable one for teaching mechanical drawing to those who are to be draftsmen, but the average apprentice machinist such as this young man does not see the direct application of this instruction to his daily work. He enrolled in the drawing school for a definite purpose. To be sure, it was a narrow one, but, nevertheless, it had economic value to him. The training in mechanical drawing which a machinist needs is not the same as that of the draftsman. This young man shows that he needs a course in blue-print reading and in arithmetic for machinists.

The same applies to other courses. A number of loom-fixers in a worsted mill applied for a course in loom-fixing in a textile school. The instructor began his lessons in the simplest loom — a cotton loom; the worsted loom-fixers soon lost interest and left the class in a body. They were not interested in cotton looms. Two classes should have been formed, one for cotton and another for worsted loom-fixing. Hence, evening high-school instruction in technical classes should be divided into small unit courses so as to satisfy a definite need. Just what unit courses should be offered in a school may be determined by allowing one whole week for preliminary registration, so that every worker may attend and talk over the educational needs of the different industries in the community. Then it will be possible to determine what unit courses to offer and the content of information to impart to the men.

The first lesson in an evening school should be the most interesting one of the course. The teacher should show the value of more knowledge on the subject by offering an incentive the first evening. In this way he can hold the attention of the class and win their confidence, and at the same time have all of them leave the class the first night with some additional information.

Instructors in evening vocational classes should be practical men and women with considerable trade experience. Considerable shop practice should be used in applying the principles underlying the trade. The actual blue-prints, shop problems, and methods should be used in this course. Subjects that do not find continual application in the trade should be given in the advanced rather than in the elementary course. The instruction in the various branches of mathematics should be adapted to meet the needs of the machinist, the plumber, and the carpenter. How to find the size of a tank does not awaken the interest of the carpenter as much as the problem involving the same operations dealing with the construction of a house. The terms used in the schoolroom should be expressed in the language of the shop and the mill.

All technical students should be classified, as far as possible, into vocational classes according to their trades; for example, a class in arithmetic for engineers and a separate class in the same subject for boiler firemen. Again, the textile designers should have a class in arithmetic called cloth calculations. This idea carries out the plan of the old trade guild of a few centuries ago. Each guild was formed for the purpose of social intercourse and mental stimulus. Each trade had its own guild. The daily trade experiences of each member became the property of all members. Discussion relating to the practices of their chosen trade occupied their attention. So to-day workmen have common trade interests. When evening students are grouped according to their occupations, they have an opportunity to talk over their interests. The teacher should act as a leader and draw out of the students their trade experiences, and through the expressions of these various opinions solve the problems. It may be difficult to get students to recite and express themselves at the blackboard, but a free discussion of the point at issue makes the student lose his self-consciousness, and before he is aware of it, he is at the board illustrating his particular method of solution. Of course, such discussions should be under the wise guidance of the teacher.

Provision should be made for the students who cannot attend but once or twice a week. It is quite common for students to stay away because they cannot attend "regularly." This applies to a great many factory workers. In prosperous times the mills are run evenings and the employees are expected to work overtime. But they can usually get away for one night in the week during such times. They cannot always tell definitely what nights they will be called upon to work. Students who are working overtime should be allowed to attend any night during the week after the session is fairly started. Such a plan is feasible. Boiler firemen alternate in working day and night. A fireman who works days this week will work nights next week, and so on. In a word, every effort should be made on the part of the instructors to accommodate the changing time-schedule of the individual student, and to awaken within him that self-interest in the progress of his school work which will enable him to do the very best of which he is capable.

Unit courses should be very specific. To illustrate: A course in any branch of cotton manufacture should not be simply cotton manufacture, but divided into units as follows: —

Picker and card room..	50 lessons, two hours an evening
Combing............	“ “ “ “ “ “
Drawing and roving frames............	“ “ “ “ “ “
Ring spinning and finishing.............	“ “ “ “ “ “
Mule spinning........	“ “ “ “ “ “
Cotton sampling......	“ “ “ “ “ “
Advanced calculations in carding and spinning..............	“ “ one hour a week

Weaving and Warp Preparation Departments

Spooling, warping, and slashing...........	50 lessons, two hours an evening
Plain weaving and fixing...............	“ “ “ “ “ “
Fancy weaving and fixing..............	“ “ “ “ “ “
Weaving and fixing (French class)......	“ “ “ “ “ “
Weaving and fixing (Portuguese class)..	“ “ “ “ “ “
Advanced calculations in weaving.........	“ “ “ “ “ “

Designing Department

Elementary designing and cloth construction	50 lessons, three hours an evening
Advanced designing and cloth construction	“ “ “ “ “ “
Jacquard designing	“ “ “ “ “ “

Knitting Department

Special knitting	50 lessons, two hours an evening

This presentation will serve not only to catch the eye, but it will offer an incentive to the tired worker to attend the class.

In addition to unit courses, evening instruction should provide for multiple units of subjects organized into departments. Each department in the school should have a head and one or more assistants. Opportunity should be provided for a student to take one subject called a “major” and one or two related subjects called “minor” subjects. To illustrate: A young man enters a class for machinists. He finds difficulty in reading blue-prints and handling fractions and decimals. The major subject is machine shop and his minor is blue-print reading and arithmetic. It is better for a student to take his major and minor subjects in one department. It is this major subject which has drawn the student into school, and it is this which will keep him, and the minor subjects like arithmetic must be closely related to the major in order to hold his interest in the related academic work. The time to teach fractions and decimals will be when they come up in connection with shopwork. He sees the advantage of arithmetic at the time and becomes intensely interested in it. Then the teacher's assistant may take a group into another room or to a blackboard and explain the related arithmetic to them. With a little drill they will profit by the instruction.

Evening technical instruction in order to be effective must combine, closely, practice and theory — practice and thinking about the practice. Since the student attends in order to meet some definite need, it is usually something closely related with his daily work. Practical training in his trade affords, in addition to skill, an apperceptive basis; that is, a background of experience illustrating rules, principles, and theories. Without a body of practical experience preceding or accompanying it, technical education, in spite of the claim that it may be useful in later life, to a large degree is a pure abstraction that is neither interesting nor tangible, so that evening technical classes should be adapted for those engaged in the trades and old enough to profit by the instruction. On the other hand, we must not forget that there are a great many people who are "handy" or mechanically inclined, and who are not engaged in the trades, but who have been able to profit by evening instruction. They have used the small amount of instruction received in the evening shops in addition to their natural ability to obtain positions in the trades. In this way evening technical classes may assist mechanically gifted people not engaged in the trades to become proficient in the beginnings of a trade so as to obtain a position. The evening technical classes act as a port of entry from an unskilled to a skilled trade.

To summarize the above: The advanced evening continuation course of study should be composed of single and groups of subjects. By means of group courses it is possible to work out a systematic course with a definite aim or goal in view.

Recreation

Formerly children developed their bodies by play and by performing the necessary chores around the home, the yard, in the woods and fields. The adolescent factory worker does not enjoy a wholesome physical life, one in which the whole body is exercised — the heart and the lungs. Since these conditions no longer exist, organized recreation must be established for the things which are now lacking in the environment of the child's home and factory life. Therefore, continuation schools should provide, in addition to academic and technical training, clubs and social centers in the school to meet the recreational needs of the growing boy and girl. Communities must establish municipal gymnasiums, baths, and recreation centers where young factory workers may go and obtain natural exercise, so as to counteract the one-sided fatigue due to monotonous drudgery of factory life.

To do this, the architecture of the public schools will be greatly affected. They will have auditoriums, kindergartens, gymnasiums, shower-baths, roof gardens, and roof playgrounds. The school, in addition to being a place for the education and amusement of children, will become a neighborhood center for parents and others in the community.

Prevocational courses

Prevocational classes should be established in the last three years of the grammar school. The school day should be divided into equal parts, one half devoted to academic work and the other half to industrial work. The aim of this course is to provide for the child of twelve years or over a combination of academic and industrial instruction that will appeal to pupils whose mentality is "sluggish" and whose tastes tend toward manual instead of formally academic work. It is necessary to have the academic subjects correlated with, and supplemented by, the manual activities. A careful study in these classes should be made of the aptitude of the children for information imparted about the trades they desire to enter.

The boys' work should include samples or projects taken from the trades practiced in the community, such as the woodworking, metal-working (machine, sheet, and plumbing), printing, etc.; and girls should take subjects in the household arts. Experience shows that pupils who select prevocational work remain at school and become interested in the "Three R's" and also receive the beginnings of industrial work. They are able to determine intelligently before they leave school the type of work they are best fitted to pursue.

Vocational direction

Since the public school assumes the responsibility of preparing a young person for a vocation, it must also assist him to select a vocation for which he is fitted physically and temperamentally. This is one of the most serious duties imposed upon the public school, because eventually it means that the problem of supply and demand of labor and the problem of distribution of human talent will be placed on the public-school system of this country. This is one of the reasons why this vital problem should be solved in a careful, scientific way, with due regard to each person's aptitudes, abilities, ambitions, resources, and limitations, and at the same time taking into account the relation of these elements to the opportunities and conditions of success in the different fields of labor. Children should be employed in positions for which their health, capacity, and intellect best adapt them. If this is done, it means well-rounded and efficient manhood and womanhood. On the other hand, an occupation out of harmony with a young person's aptitudes and capacities means inefficiency and a loss to both the employer and employee. A large number of adults who prove failures in life can trace the cause to the lack of proper guidance in both school and juvenile employment.

The vocational direction or guidance department of a public-school system should be a part of the organization of the continuation school and should be in charge of a director called a "vocational counselor," who should have full power over the granting of working certificates and providing employment for young people who desire to go to work.

A vocational counselor should be a person with a sympathetic interest in young people. In addition, he should have information in regard to the opportunities for work for young people. In order to obtain this information the counselor should have an appropriate personality to approach employers and the ability to do research work and to organize this information in proper form for use. This may be carried out by dividing vocations into five large classes, the professional, the commercial, the agricultural, the industrial, and the household. Under each class we may have divisions and subdivisions of occupations. A record of qualifications and the supply and demand of different positions should be on file. It is well to make a survey of all the existing schools and the courses offered to young people. A chart may be made illustrating the educational opportunities in the community. A survey may also be made of the positions open to young people by using the form shown on the accompanying chart (pp. 102–05), which has been used successfully by the National Society for the Promotion of Industrial Education.

In order that the vocational counselor may properly look after the welfare of the individual child, it is necessary to know definitely the time that he should begin to work and the kind of work that he is able to do. Physicians tell us that the mental and physical condition should not be overshadowed by being brought into use before the development adapted to such use is established; and on the other hand, that functions, both mental and physical, are weakened by not being brought into use when they are ready to be used.

This means that the mental condition of the child should be carefully determined, to see whether the child should be allowed to work at all. Before this is done, it is absolutely necessary to know the kind of work the boy or girl is to perform. After it is determined by tests that he has the mental equipment and the degree of knowledge necessary to do a certain form of work, the next problem to be solved is whether his physical condition is such that this particular kind of work will not harm him. Since labor differs in character, occupations should be classified, and the boy or girl should be allowed to perform only the character of work that is best adapted to his or her physical condition.

It is evident, then, that some additional aid should be required for determining the fitness of an individual, either for his school or physical work, beyond the usual superficial examinations now conducted for fitness. A very eminent physician on children's diseases, the late Dr. Thomas M. Rotch, for a number of years made a study of means of determining the relation of physical fitness to certain degrees of labor and to school work.

The close relation which is known to exist between physical growth and the development of the epiphyses led him to make some investigation by means of the Roentgen rays on the living anatomy of early life during the different stages of development. A study of a large number of cases showed that under normal conditions all the centers of ossification progressed with comparative regularity, and that the degree of

I. What is the character of this job?

Name of job.	Is it on an automatic machine, single process?	How many processes are involved in this job?	What are these processes?	What per cent of all workers in the industry are employed on this job?	How long does it usually take to train a worker on this job?

II. Relative place which this job occupies in the industry.

Is it, or is it not, a necessary step for promotion in the industry?	What is the next job in the line of promotion?

III. Wages on the job.

What is the initial wage?	What is the average wage?	What is the highest wage?	What factors control the increase?

IV. To whom is the job open?. What is the tenure?

Is it work for boys or girls or both?	At what age are workers employed?	Are there any decided physical or health requirements?	Are there any legal restrictions?	At what age do workers reach their maximum efficiency?	At what age is efficiency seriously impaired?

V. *Recruits to the ranks of workers on this job.*

Where does the industry get its recruits for this job?	What particular equipment do those selected bring without training for this job?	From what sources do employers prefer to get recruits for this job?	Why do they prefer to get recruits from the sources named?

VI. *What equipment does a worker in this job need?*

General knowledge.	Trade knowledge.	Technical knowledge.	Manipulative skill.

VII. How much does the industry give of the required equipment, and how well does it give it? (What can the worker pick up on the job?)

General knowledge.	Trade knowledge.	Technical knowledge.	Manipulative skill.

VIII. How much and what of the required equipment must be gained from other (school) sources?

General knowledge.	Trade knowledge.	Technical knowledge.	Manipulative skill.

development of the wrists and hands represented to a fair degree that of the entire body framework. This correspondence of the development of the wrists and hands to that of the rest of the skeleton is especially fortunate, as it is evident that the wrists and hands are the most available parts for routine examination in a large number of cases. This anatomic relation has been substantiated by other physicians of high standing.

Similar tests may be used to determine whether the child has a predisposition to any disease, etc., so that a reliable and very practical method of conducting a physical examination may be made in which results will show whether the child has the proper physical development to perform physical work of a certain character. This method of physical examination is at present conducted by the United States Government at the Naval Academy. Children with any physical weaknesses should be encouraged to go into occupations that are compatible with their physical condition.

Placement Bureau — Occupations and the opportunities

When a child applies for a working certificate he should be influenced to stay in school. If it is necessary to earn some money, part-time rather than full-time employment should be provided. Children should be advised to make the most of the "blind-alley" occupations that are open to them at that time and to attend continuation school and prepare for better positions.

Since the knowledge and training imparted to a child is to prepare him for life, the school should follow up the boys and girls who leave and see how successfully the children have been prepared. The school is to judge by the success and failure of the children who are out in the school of life. A continuation-school teacher should be assigned to look after a definite group, in addition to the regular school work.

Information relating to vocational life may be taught under the head of civics. There is a very intimate connection between vocational success and good citizenship. Every successful citizen should be an efficient producer and should render service to the community. Included in the course should be material relating to the economic activities of the community, which should include the history and opportunities, etc., and all the positions in the industries. In this way children will be taught their industrial obligations and opportunities.

In fact, every subject in the courses of study is susceptible of an industrial or vocational interpretation. Teachers have numbers of opportunities to speak to the children in terms of industrialism and citizenship. Frequent excursions should be made to industries to obtain first-hand information. History should be centered around the growth of industries as successfully as it has covered literature, politics, and the careers of successful generals, statesmen, etc.

PREVOCATIONAL COURSES IN ELEMENTARY SCHOOLS IN NEW YORK CITY

UNDER THE DIRECTION OF DR. WILLIAM L. ETTINGER, ASSOCIATE SUPERINTENDENT OF SCHOOLS

Tentative Course in Joinery

The first two problems are class exercises from start to finish. They are worked out step by step. Individual instruction is given in succeeding problems which, as far as possible and practical, call for the use of but one additional tool. Additional problems are given according to the pupil's ability.

Projects	*Illustrating*	*Shop-talks*
Construction of appliances for joinery and other shops.	Use of vise, smoothing plane, rule, try-square and hack-saw. Use of brace and bit.	Proper care of shop equipment; benches, tools, etc. Definitions, proper care and use of hand tools.
Shelves, racks, boxes, bulletin boards, and small problems for shops.	Common joints, such as butt, housed, end and cross lap. Use of hammer and chisel. Use of mallet gauge, cross-cut and rip saw.	Definitions and use of tools. Laying out work. Selection and preparation of stock for different purposes.
Repairing and construction of school furniture and equipment for shops.	Use of hot and cold glue, handscrews and clamps. Use of screwdriver, bit and gimlet bit.	Definitions and use of tools. Characteristics of different varieties of wood. When and where to use nails, screws, dowels, and glue as fasteners.

Projects	*Illustrating*	*Shop-talks*
Picture frames. Interior house trim and moulding.	Building details; making, placing, and repairing of same. Use of bench dogs. Use of miter box, block plane, and rabbet plane.	Building details. Wood used in building construction. Tools and wood-working devices.
Construction of window and frame, and door and frame.	Building details. Flat and raised panels. Tongue, groove, rabbet joints. Machine work use of bevel and level.	Forms of construction with regard to swelling, shrinking, and twisting. Use of rods.
Construction of paneled cabinet with drawers.	Dove-tailed joints, paneling, setting of hinges, lock, and handles. Finishing, staining, and varnishing.	Laying out work. Selection of material. Stains, varnishes. Hardware.
Pattern of machine bracket.	Shrinkage, draft, finish. Method of moulding.	Moulding, finishing, two-part flask and foundry methods. Seasoning of wood and use of shellac.
Pattern of bracket.	Core work.	Moulding and core work.
Pattern.	Split work.	Moulding.

Tentative Course in Machine Shop

Model No. 1

Parallel clamp, consisting of two pieces of square steel and two pieces of round steel.

Operation 1. Use of power hack-saw.
2. Filing end square in vise.
3. Use of shaper machine.
4. Use of center punch, hammer, dividers, square, scriber; drilling holes for tapping, and also clearance holes for screws; turning screws and knurling heads of same in lathe; use of hand dies in vise for threading screws. This tool may be used to advantage in carpenter shop, tinsmith shop, and machine shop.

Model No. 2

Outside stiff-joint calipers. This consists of a flat piece of steel 6 inches long, 4 inches wide, 1-16 inch thick.

Operation 1. Use of hand hack-saw and vise.
2. Laying out shape of legs with dividers.
3. Spacing distance for drilling holes to the shape of the leg.
4. Filing the lines of radius, internal and external.
5. Laying out and drilling holes for riveting.
6. Lathe work turning rivet and drilling washer.
7. Riveting countersinking.

This tool can be used by pupil in connection with other work in shops or where accurate outside measurement is required.

Model No. 3

Center-punch made of tool lathe.

Operation 1. Cutting off steel in power hack-saw.
2. Straight turning in size.
3. Taper turning with use of compound rest.
4. Knurling in lathe with knurling wood.
5. Use of parting or cutting-off tool in lathe.
6. Hardening and tempering.
7. Polishing in speed lathe.

Besides those above described, we have considered the adoption of the following models, in connection with a twenty-weeks term: —

V black; surface gauge; tri-square, and paperweight.

The operations for the manufacture of these models are similar to those above described.

Tentative Course in Printing

Weeks	*Practical Work*	*Shop-talks*	*Correlation*
			English
1.	Learning arrangement of alphabet in type case. Making diagram of type case. Memory tests in location of alphabet in type case. Posture at case and holding stick.	Printing in education and commerce; in newspapers and periodicals. Use of equipment and material.	Spelling. Punctuation. Capitalization. Syllabication. Abbreviation. Paragraphing.

Weeks	*Practical Work*	*Shop-talks*	*Correlation*
2.	Exercises in putting type into stick. Technical terms: *a.* Used in composing-room. *b.* Used in pressroom. "Justifying" type into stick.	Care of leads, slugs, and furniture. Rollers and inks. Sizes of type and spacing-material in picas and points.	*English* Proof-readers' marks. *Mathematics* "Casting off" copy. Cutting paper. Measuring type from galley proofs.
3.	Feeding press without form (cards). Styles of type faces — *a.* For use in text.	Importance of careful distribution.	
	b. For use in display. Care of press — *a.* Washing off ink. *b.* Oiling. Exercises to develop speed and uniformity of motion of hand between case and stick.	Typographical errors — their causes.	*History* Gutenburg and other early printers. Development of printing-press and type.

Weeks	*Practical Work*	*Shop-talks*	*Correlation*
4. *to* 6.	Feeding press with form (cards). Composition — "Straight matter" (reprint) and distribution. Correcting proofs with proof-readers' marks.	Different types of printing-presses. Avoiding "false motion" in setting type.	*History* Hand lettering.
	Use of furniture — *a.* Wood. *b.* Metal.	Different kinds of type cases.	
	Feeding press (paper).		
7.	"Overrunning" type — *a.* Narrower. *b.* Wider.	Type-making.	
	Composition — "Straight matter" and distribution.	Bookbinding.	
8.	Stone work — *a.* One-page forms. *b.* Two-page forms. *c.* Four-page forms.	Paper-making.	

Weeks	Practical Work	Shop-talks	Correlation
9. *to* 10.	Composition — Simple commercial. Forms.	Display composition.	
	Press work — "Make-ready" of small commercial forms.	Cylinder presses.	

Tentative Course in Plumbing

1. Soldering a seam on sheet lead.
2. Making a cup joint on lead pipe by means of soldering-iron; size of pipe from 1¼" to 2", inclusive of both sizes.
3. Making a butt or overcast joint on lead pipe; sizes of pipes from 1¼" to 2", inclusive of both sizes.
4. Making and putting on lead tacks on lead pipe.
5. Wiping a ¾" horizontal round joint on lead pipe.
6. Wiping a ¾" horizontal branch joint on lead pipe.
7. Wiping a ¾" upright round joint on lead pipe.
8. Wiping a ¾" upright branch joint on lead pipe.
9. Cutting and threading screw pipe to measure.
10. Cutting and caulking cast-iron pipe.
11. Joint wiping to be continued on 1¼", 1½", and 2" lead waste pipes.

Tentative Course in Electric Wiring

Weeks.	*Shopwork*	*Shop-talks*	*Related work*
1. *to* 4.	Electric wire to joints: properly made, soldered and taped. Simple bell circuits: vibrating bells and buzzers in parallel. Running exposed wiring for bells.	Economy in the use of material and labor time. The time-sheet. Bell parts, buzzer parts and connections. Batteries: The dry cell, its construction and advantages; the sal-ammoniac liquid cell, where used, how charged and maintained. Types of open, short, and grounded circuits; their discovery, removal, causes and their effects; prevention. Reading the supply catalogue.	Spelling of terms used. Composition; brief description of projects. Arithmetic. History: assigned reading. Geography: Natural source of materials. Sketches.
5. *to* 8.	Single stroke bells. Vibrating bells in series. Multiple bells. Changing tone of bells in groups. Running concealed wiring for bells.	Types of terminal connections; their use, preparation, care, and proper methods of attaching wires. Selection and use of push buttons with double and triple contacts.	New assignments in above subjects. Drawing: symbols and their uses. Science: electro-magnetism.

Weeks	*Shopwork*	*Shop-talks*	*Related work*
		The strap key and its advantages. The use of multiple-point lever switches, and the proper attachment of wires to points. Consulting the Electrician's Handbook.	
9. *to* 11.	Annunciators. Drops. Constant ringing attachments. Burglar alarms: Closed circuit and open circuit. Wiring for closed-circuit systems.	Types of annunciators; their construction and advantages. Repairing same. Automatic drops and constant ringing attachments. Method of cabling wires; types of cable, and methods of tracing and marking wires in cables. Description of burglar-alarm apparatus; window and door spring; sundry attachment. The closed-circuit battery bell; its principle, care, and method of charging.	New assignments in above subjects. Drawing: simple floor plans. Science: conductors and insulation.

Tentative Course in Power Machine Work

Shop-problems

Weeks

1. Shop apron of unbleached muslin to be worn in shop.
2. Envelope bags of unbleached muslin to keep work.
3. Child's gingham dress. Scalloping machine introduced and practiced.
4. Child's flannel nightgown with scalloped collar. Hemstitching machine introduced and practiced.

Shop-talks

The machine and its construction. Oiling; card; setting of parts. Danger — result of inattention.

Various seams and uses. Biases; hems. Value of garment-making. Neatness, accuracy, and speed.

Planning and cutting with as little waste as possible. Textiles; materials; cost.

Difference in construction of special machines from plain sewing-machines.

Related work

English

Spelling words used during term.

Composition

Headings given; as, The Power Machine. (Describe in steps the making of a garment.)

Letters

Ordinary samples of materials, prices and width.

Complaints that goods have not been received.

Applications for positions.

Mathematics

Industrial investments; trade problems; trade incomes; buying and selling; profits and loss.

Billing goods to the trade, and sweat-shop work.

History

Textiles and inventions.

Weeks	*Shop-problems*	*Shop-talks*	*Related work*
5.	Child's flannel petticoat. Scalloped ruffle. Embroidery introduced and practiced.	Gussets, ruffles, collars, bands, bindings, facings with use of machine attachments.	*Geography* Commercial and industrial. *Drawing* Designs made to use on special machines. Sketches of garments finished. Hats for straw machine.
6.	Child's drawers of muslin. Ruffles hemstitched and tucked. Straw machine taught.	General review of garments made and principles involved. All machines.	
7.	Fancy apron of lawn, using one of three special or baby dress of cambric.	General review of garments made and principles involved. All machines.	
8.	Girl's princess slip using special machines.	General review of garments made and principles involved. All machines.	
9.	Middy blouse.	General review of garments made and principles involved. All machines.	
10.	Finishing all jobs.	General review of garments made and principles involved. All machines.	

Tentative Course in Dressmaking

Weeks	*Shop-problems*	*Shop-talks*	*Related work*
1.	Bag.	Correct position when sewing.	*English* Composition, spelling, letter-writing, business forms, textiles.
2.	Apron by hand square or round buttonhole model.	Intelligent use of tools.	
3.	Flannel or muslin petticoat.	Habits of accuracy and neatness in work.	*Mathematics* Percentage discount, profit and loss. Applied problems.
4.	Bloomers, circular or plaited.	Textiles.	Methods of sending money.
5.	Infant's dress.	Care of machine.	Common fractions.
6.	Nightgown, muslin.	Cutting by pattern in detail.	*History*
7.	Drawers or corset-cover.	Economy in buying good material.	*Geography* Weaving, textiles. Period of fashion.
8.	Skirt, 3-piece, gored.	Fitting.	Civics, home of raw materials.
9.	Middy blouse.	Requisitions.	Commerce and industries, New York.
10.	Middy blouse.	Review.	*Drawing* Designs, conventional and geometric. Figure study.

Tentative Course in Novelty Work

Weeks	*Shop-problems*	*Shop-talks*	*Related work*
1.	Stitches.	Stitches used in novelty sewing. Accuracy in work.	*Composition* Headings: Machines; Materials.
	Round pin ball. Needle case.	Care in handling and cutting materials.	Description of articles made in class.
2.	Sewing bag.	Care of machines, use and construction. Cutting cardboard. Use of paste. Care of tools.	Spelling words used in classroom. *Arithmetic* Problems of cutting. Buying and selling. Profit and loss. Cost of articles.
3.	Opera bag.	Different materials and trimmings used in the trade.	*History* *Geography*
4.	Collar bag. Bag with foundation box.	Talk on bags.	History of machines and materials.
5.	Sewing-box with bag top.		
6.	Pin-cushions. Lamp shades.		Women's work. *Drawing*
7. *to* 10.	Sample books. Mounting of samples. Making of boxes. Bookbinding.	Styles of samples. Material used. Different styles of boxes.	Designs to use on bags and in cutting boxes.

Tentative Course in Sign-Painting and Lettering

Weeks	*Shopwork*	*Shop-talks*	*Related work*
1. *to* 9.	(A) Study of brush. (B) Examination and study of cardboard. (C) Use of brush. (D) Initiating strokes. (E) The single stroke. (F) Mixing colors. (G) Use of important colors. (H) Two-color work applied.	(A) Value of sign-painting and lettering. (B) How to handle the brush. (C) Kinds of brushes. (D) Meaning of "Single Stroke." (E) Meaning of "Ply" used with reference to paper and cardboard. (F) Color and its consistency. (G) Two-color work. (H) Use of important contrasts. (I) Complementary colors. (J) "The artistic eye." (K) Matching colors.	(A) Composition and spelling. (B) Technical words and terms used in sign-painting and lettering. *Geography:* Source of chemicals used on sign-painting. *Science:* Primary colors: color combinations. *Arithmetic:* Use of rule, approximations. Problems involving: cost of stock and tools, areas, perimeters, etc.

Tentative Course of Study in Trade Drawing

Shopwork

A. Practice in the use of the T-square and triangle.
B. A series of exercises covering the following: —
  1. "Straight-line" objects, the lines of which are at right angles.
  2. "Straight-line" objects of which some of the lines are at 30 degrees, 60 degrees, and 45 degrees.
  3. "Straight-line" objects introducing the use of "dotted" lines.
  4. "Straight-line" objects of which no lines are parallel to each other.
  5. Review of "straight-line" objects by giving the pupil a blue-print of a perspective drawing of a simple object (such as a table, etc.) and requiring a working drawing thereof.
C. Practice in drawing circles.

Shop-talks

1. Aside from the talks which are directly related to the drafting-work of an exercise, there will be a 10 or 15 minutes' talk every day (if advisable) on the use of the object and its relation to other parts, — the method or methods used in the manufacture of the object, etc.
2. General talks on such allied subjects as: —
Hard and soft wood and their relations to the trades.

Shopwork

D. A series of exercises covering the following: —
  1. Simple circular objects.
  2. Objects containing circles tangent to straight lines.
  3. Objects containing circles tangent to circles.
  4. Objects bringing out the use of "cross-sectioning."
  5. V and square threads.

E. Working drawing from freehand sketches made by the pupils in the machine and other shops.

F. Inking penciled drawing, tracing and reading of blue-prints.

G. Making assembled and detailed drawing from blue-prints of machine parts.

H. Spur and bevel gear.

I. Worm and wheel.

NOTE — Drawings to illustrate the steps suggested may be sketched on the typewritten sheets, or, if preferred, blue-prints may be furnished for same.

Shop-talks

3. Copper, steel, brass, iron, aluminum, and other metals and alloys used in the building of machines.
4. Pattern-making, moulding, and foundry work.
5. Machine-shop practice as it is related to the drafting-room, etc.

Millwrighting

This course is adapted to boys of limited academic ability working in "blind-alley" positions in factories and mills. This instruction should be provided for two years on a full-time or four years on a half-time basis.

The following course of study is being carried out in the Fall River Technical High School:—

Course of Study (two years)

	Time allotment (per cent)
English, history, civics, etc., shop mathematics, sketching and blue-print working	20
Laboratory practice and observation of the following subjects: concrete and masonry, vocational chemistry and physics, hydraulics and plumbing. General knowledge, rather than specific ability is required in these subjects	30
Shop practice in the following subjects: Rough carpentry and pattern-making, general repair machine work, care of belts and gears, care of motors and dynamos, and electrical wiring of a rough character, painting, glazing and plumbing	50

In every manufacturing community there is a demand in the factories for a type of millwright, or "handy man," who is able to do rough carpentry and pattern-making, general repair machine work, to take care of belts and gears, motors and dynamos, to do painting and glazing and electrical wiring of a rough character. This work does not demand the skill of a tool-maker or cabinet-maker, and will appeal to the boy of ordinary mechanical ability.

Method of teaching. The method of teaching must be based upon the existence of a maintenance problem in a factory. Some work of this kind can, no doubt, be found in every school, and in order to make the work efficient, it is probable that some outside sources of supply can be found. Arrangements should be made to let the boys work on a part-time basis in a factory, or have them, one at a time, spend some time in a mill at least watching work of this kind while it is being carried on. In order to secure the highest degree of correlation, it is desirable that the first-year shopwork be based upon the project method; that during the second year, so far as practicable, the technical work be separated from the shopwork and handled upon a laboratory basis. It is needless to point out that in general the greater the degree of correlation the better.

Machine shopwork. Repair machine work differs from the regular production work chiefly in the lack of special machines in equipment, and in the fact that the machinists usually go with their jobs from machine to machine. In many cases the equipment is either inadequate or antiquated, and they have to exercise considerable ingenuity in doing their work with the means at their disposal. These conditions should be duplicated as nearly as possible in the shopwork of this course. The course should include such work as ordinary operations on the sensitive and heavy drill press, milling, plain and simple index milling, including the cutting of plain gears, plain shaper work, and considerable lathe work, including work on the cutting lathe.

Blacksmithing. This work could be adequately carried through with one or two small portable forges placed in the machine shop. Work of this kind should include bracing and some hardening and tempering.

Electrical work. The electrical work should include a study of the gross anatomy of the dynamo and motor. The pupils should learn the names and functions of parts, assemble and disassemble motors, and should become familiar with method of control, reversing, starting, etc., low tension work with number 18 wire; the usual series of board problems can be worked out with bells, annunciators, etc. Practice should be given in wiring, exposed wiring of the mill type, including drilling in concrete and masonry, and some work with conduits, connecting-up dynamos and motors according to the instructions furnished with these machines. House wiring, as distinguished from mill wiring, should not be attempted to any extent. Maintenance work or interior circuits, including maintenance and simple repairs on dynamos and motors, should also be included. Considerable practical work can be found in the school itself. This can be supplemented by outside work through coöperation of the mills or from the school department.

Carpentry work. Carpentry work should be of the character required of the mill machinist. The boy should carry the job through, both at the bench and, so far as safety permits, at the machines. Work should be entirely in the cheaper woods and should not call for a high degree of accuracy or finish. The following subjects should be covered in the course: Butt lap, and half-lap joint (no dovetailing); putting up rough partitions, and flooring; building stages and scaffolding, boxes and trucks. The aim is to turn out a comparatively rough, handy carpenter, and not a cabinet-maker; hence furniture-making should not be included.

Steam piping. The object of this work should be to turn out a mechanic who can cut the ordinary iron piping and who knows how to cut threads so as to make a tight joint, working from a sketch plan. It should include the use of the hack-saw, the cold-chisel, hand-dies for threading, and the operations of making up a threaded and union joint with different types of valves, elbows, tees, etc. This work cannot very well be done on an exercise basis, and therefore should be included in the shopwork, because the only way to test the job is by putting steam into it.

Pattern-making. The mill machinist is often called upon to make simple patterns, mainly where a piece of repair work is needed. For example, a gear breaks and a simple pattern is made from the broken gear, sent to a local foundry, and the casting is made in the machine shop. Usually the important factor here is time, rather than extreme care in the waste of iron. Solid patterns and simple cord patterns cover all the demands of this course. These patterns should be made in the cheap wood, without extreme regard to accuracy. Instruction should include the use of the shrink rule for iron and brass, and provision should be made for the boy who has made the pattern to visit the factory, so that he will understand the process of making the mould.

Painting and glazing. The aim of this work is merely to turn out a worker who can set an ordinary pane of glass. Instruction would therefore include removing broken glass, cleaning out the putty and old tacks, putting in the new glass, tacking and puttying the work.

Concrete and masonry. Concrete: mixing, control of properties of concrete by changing the ingredients, good and bad mixtures for different purposes, pouring, setting, forming, dressing, etc., making paths, concrete forms of different kinds, as opportunity offers. Masonry: brick, hollow, tile, etc., laying, binding, arching, taking down old brickwork, the laying to line of masonry, mortar, the ingredients of mortar, control, conditions affecting settling, etc. This work should be largely laboratory in character, following the lines of the New York Trade School, where work of this kind is first set up and then torn down. This should be supplemented by some construction work.

Engines and boilers. The aim of this course is to acquaint the pupil, in a general way, with the construction, operation, and function of steam units. This should include a general knowledge of names and functions of parts, and of the slide valve engine, the cross-compound engine, functions of accessories, such as feed pumps, injectors, gauge glasses, steam gauges, ash-pits, different types of boilers, etc. Laboratory study along these lines can be carried on with a large number of materials secured from the junk heap and fitted for this purpose through the melting out of certain parts, so as to include the insides. In addition, a study of the gas engine should be included.

Drawing. The aim of this course is to give some degree of familiarity with reading all sorts of plans, — piping plans, electrical wiring plans, machine-shop blue-prints, carpentry plans, plumbing plans, etc. (1) Exercises in reading simple plans of all the above; (2) exercises in sketching layouts, especially where the pupil is required to trace out a circuit, electrical, steam, or plumbing, etc.; (3) elements of mechanical drawing, simple work in the use of instruments and projections.

Trade mathematics. This course should include elementary instruction in rough trade methods of computing material, such as lumber, brick, concrete, time, cost, etc., as given in *Vocational Mathematics*, ✓ published by D. C. Heath & Co., Boston, Massachusetts.

Vocational science. The vocational science may be taught on a laboratory basis, with practical demonstrations. It should include a rather general knowledge of a number of the simpler facts of physics and chemistry as applied to trades, such as the effect of temperature upon material, expansion, contraction, melting, boiling, distillation, a little study of light, based upon the taking of photographs, properties of metals, etc., and a notion of the terms used in hydraulics, such as "head of water," "water flow," etc., which should be based upon a study of the local water-supply system. Pupils should be taught to explain practical questions, such as why concrete sets; how a furnace is built to give good combustion; what makes steam pressure; how it is controlled; what makes a dry boiler burst; how a fusible plug works; why a saw-tooth roof is used on a weave shed to get good light; how electric lights are laid out in order to give proper illumination, etc.

A Suggestive Continuation School Course in Home-making

(*Used in the Fall River Technical High School*)

Arithmetic in relation to: —[1]

I. Dressmaking, millinery.
II. Personal expenditure.
III. Household.
IV. Business.

English: —

I. Correction and improvement of everyday speech.
II. Personal and business correspondence.

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[1] See *Vocational Mathematics for Girls*. D. C. Heath & Co., Boston, Mass.

III. Cultivation of a taste for reading.
IV. Use of a typewriter.

Civics and History: —

Study of local history and government.
Study of history applied to the needs of the pupils.
Women's responsibilities.

Needlework: —

I. Dressmaking, embroidery, etc.
II. Millinery.

Textiles: —[1]

Study of Fabrics: —
I. Name.
II. Cost.
III. Durability.
IV. Uses.
V. Distinguishing qualities.
VI. Laundry.
  Effect of hot and cold water on fabrics.
  Plain washing, drying, ironing.
  Use of chemicals.
  Washing and drying of delicate fabrics, embroideries, laces.

Design: —

Art as applied to a woman's clothing: —
I. Color.
II. Line.
III. Fabric.
IV. Appropriateness.

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[1] See *Textiles*. D. C. Heath & Co., Boston, Mass.

Home furnishing: —

Selection of furniture in relation to: —

- I. Beauty.
- II. Economy.
- III. Suitability.
- IV. Sanitation — Sweeping and dusting living-rooms.
  - Washing floors, walls, woodwork, windows.
  - Care of carpets and rugs.
  - Chamber work.
  - Care of garbage.
  - Care of plumbing.
  - Ventilation.
  - Water and ice supply.
  - Disinfection.

Cooking: —

Economy and management of the kitchen: —

- I. Plain cooking.
- II. Food values.
- III. Simple menus.
- IV. Dining-room work.

Care of the sick — leading to nursing: —

- Food for convalescents.
- Moving the sick, in bed, out of bed, etc.
- First aid to the injured.
- Adjustment of light, heat, and air to the sick.
- Sick-room conveniences.
- Observational study of house and hotel, kitchens, dining-rooms, furnishing, laundries, manufactories, hospitals, house constructions, etc.

Suggestive Vocational Continuation Course for Girls

(Adapted from Worcester Trade School for Girls)

Two-year Course

Fifty per cent of the time should be devoted to shop-work in one of the following or additional trades: —

1. *Sewing:* —
    - *a.* Plain sewing by hand and by machine.
    - *b.* Fine hand-sewing and embroidery.
    - *c.* Plain dressmaking.
    - *d.* Advanced dressmaking.
        - Making of fancy afternoon and evening gowns of silk, broadcloth, chiffon, voile, etc.

2. *Millinery:* —
    - *a.* Making of wire and buckram frames.
    - *b.* Making of bandeaux, folds, bindings, etc.
    - *c.* Fancy trimmings and novelties.
    - *d.* Trimming of hats.

3. *Electric power machine operating:* —
    - *a.* Plain sewing.
    - *b.* Underwear.
    - *c.* House dresses and shirt waists.
    - *d.* Special machine work.
        1. Use of buttonhole machine.
        2. Use of two-needle gauge machine for corset work.
        3. Use of knife tucker.

The other fifty per cent of the time should be devoted to the following academic and physical studies: —

Academic Work

First Year

1. Trade arithmetic — (not given all year except to girls backward in arithmetic).
2. English — oral and written.
    a. Business letters.
    b. Compositions based on trade work.
3. Spelling — trade terms, phrases and words in common use.
4. Writing.
5. Citizenship — social ethics.

The above subjects are not necessarily presented parallel to each other. One subject such as arithmetic is presented for one term of fourteen weeks or two terms, as necessary, and another substituted as advisable.

Art.

1. Color scales.
2. Line, such as arrangement of tucks, rows of insertion, etc.
3. Spacing and proportion by arrangement of trimmings, etc.
4. Designs for garments, trimmings, hats, etc.

Physical Education.

1. Short drills in marching, wand drills, etc., for cooperation.
2. Games such as tag, pass ball, volley ball, etc.
3. Folk-dancing.
4. Hygiene.

Second Year

Advanced cooking (elective).

Class instructions.

1. Advanced trade arithmetic given for one term of fourteen weeks.
    - *a.* Shop organization.
    - *b.* Estimates of material for garments.
    - *c.* Economy of material.
    - *d.* Estimates for prices on single garments and large orders such as underwear, etc.
2. English.
    - *a.* Accurate descriptions of work, etc.
    - *b.* Directions for making garments or parts of garment.
3. Textiles.
    - *a.* Study of weaves, textures, adulterations, etc., through practical tests.
    - *b.* Short history of common textiles — cotton, linen, wool and silk.
4. Industrial history and geography as related to women's work.
5. Citizenship — practical civics.
6. Apportionment of income — expenditure.

Art (elective).

1. Applied design — designs for dress trimmings, hat trimmings, buckles, bands, etc.
2. Costume designing.
3. Designing of hats.

Physical education.

1. Continuation of first year's work.

Suggestive Courses for Evening General Continuation School

The classes for non-English people should be divided into four divisions: First, the literate foreigner who can speak English; second, the literate foreigner who cannot speak English; third, the illiterate English who can speak English; fourth, the illiterate foreigner who cannot speak English. The first two divisions may be divided into four grades: Beginners, intermediate, subgraduating, and graduating classes. The following represents the topics that should be taught: —

Beginners

Arithmetic, English, physiology and hygiene, reading, spelling, and writing. A large amount of the time is spent upon reading and arithmetic.

Suggestive Courses for both Day and Evening General Continuation Schools

Intermediate

Arithmetic, English, geography, physiology and hygiene, reading, spelling, and writing. A large amount of the time is spent on arithmetic, reading, and English. Pupils who can read and write should be able to do the work of this grade.

Subgraduating

Arithmetic, English, geography, history, physiology and hygiene, reading, spelling, and writing. Earnest pupils who have left day schools from the fifth or sixth grades should be able to do the work of this grade.

Graduating

Arithmetic, civil government, English, geography, history, physiology and hygiene, reading, spelling, and writing. Earnest and mature pupils who have left day school from the seventh or eighth grade should be able to do the work of this grade.

Suggestive Course of Study for Advanced Evening Continuation School

Advanced evening continuation schools should include: —

1. Course of academic studies in which the aim is to encourage young people, between sixteen and twenty who are working days, to pursue a systematic course for three years. It is possible to fit ambitious young people for higher institutions.
2. Course of commercial subjects, such as bookkeeping as a major course, penmanship and commercial arithmetic as minors, or stenography as a major and correspondence and typewriting for minors. These subjects should be pursued two years so that attention can be concentrated upon them. The instruction and methods should be definite, practical, up-to-date, and such as are used by successful experienced men in commercial and financial offices. Practical talks by successful business men should be given with frequent visits to model commercial offices.

3. Courses in a group or single units of industrial or technical subjects. These may be divided into a number of parts, such as the metal trades, textile trades, building trades, shoe trades, etc. The work may consist of hand or machine tool work or the practical mechanics. Great care should be exercised to see that the appropriate courses in the sciences and mathematics are provided as related subjects. Evening shopwork courses will offer a port of entry for young men in "blind-alley" positions to some skilled trade. Courses in home-making and trade work should be offered to women.
4. Course of study in agricultural and rural science. Evening courses can be arranged, first, to meet the needs of farmers, and, second, to meet the needs of mechanics, business men, and others who have a small garden attached to the home.

EVENING GENERAL CONTINUATION SCHOOLS

GIVEN IN THE FALL RIVER EVENING HIGH SCHOOL

Regular Course

(Diploma for three years' work)

First Period	*Second Period*	*Third Period*
French II	French I	Commercial arithmetic
Hygiene	Algebra I	French I
Rhetoric	General history	Advanced mathematics
American History I	Penmanship	English and American literature
Arithmetic I	Advanced grammar and spelling	American history and civil government
Business correspondence	Bookkeeping II	Penmanship
Elementary grammar and spelling	Bookkeeping I	Letter-writing and English
Bookkeeping I	Stenography I	Bookkeeping I
Bookkeeping	Stenography II	Bookkeeping II
Stenography II, III	Typewriting	Stenography I
Stenography I	Elementary arithmetic	Stenography II
Typewriting	Chemistry or	Typewriting
Latin I	Physics	Chemistry or
Geometry	Latin II	

First Period	*Second Period*	*Third Period*
Penmanship I	German II	Physics
German I	Wood-working*	Latin III
Sign-painting*		German III

Studies marked with * take the whole evening and no other studies can be taken along with them.

Subjects marked with Roman numerals denote the grade of work. Stenography I is for beginners' work. Stenography II is for pupils who have completed satisfactorily one year's work. Stenography III is for pupils who have completed satisfactorily two years' work.

COURSE OF STUDY FOR DAY AND EVENING GENERAL CONTINUATION SCHOOLS

Given in the Fall River Evening High School

Academic Course[1]

(Diploma for three years' work)

Select one subject for each period

	First Period	*Second Period*	*Third Period*
First year	Hygiene		French I
	Latin I	Algebra	English and American literature
	Rhetoric	General history	
	French II	French I	Advanced mathematics

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[1] For those who desire to attend higher institutions.

	First Period	*Second Period*	*Third Period*
Second year		Latin II	Chemistry
		Chemistry	Physics
		Physics	
	French II	English	Civil government
Third year	Geometry	Chemistry	Latin III
		Physics	Chemistry
			Physics

COURSE OF STUDY FOR EVENING GENERAL CONTINUATION SCHOOL

GIVEN IN THE FALL RIVER EVENING HIGH SCHOOL

Civil Service Course

(*No Diploma*)

	First Period	*Second Period*	*Third Period*
First year	U.S. geography	Arithmetic	Spelling
			Letter-writing and English
Second year	Copying and correcting manuscript	Copying addresses	Penmanship
	Copying from plain copy	Reading addresses	
	Railroad connections in New England	Civil government	

Stenography Course

(Diploma for three years' prescribed work)

	First Period	*Second Period*	*Third Period*
First year	Stenography I or Typewriting I or Correspondence	Stenography I or Typewriting I or Correspondence	Stenography I Typewriting I Correspondence
Second year	Stenography II Typewriting II	Stenography II Typewriting II	Stenography II Typewriting II
Third year	Stenography III Typewriting III	Stenography III Typewriting III	Stenography III Typewriting III

Bookkeeping Course

(Diploma for two years' prescribed work)

	First Period	*Second Period*	*Third Period*
First year	Penmanship Bookkeeping I Commercial arithmetic	Penmanship Bookkeeping I Commercial arithmetic	Penmanship Bookkeeping I Commercial arithmetic
Second year	Bookkeeping II	Bookkeeping II	Bookkeeping II

A Course for those who desire to become Nurses

First Year	*Second year*	*Third year*
1. English composition	1. English literature I	1. English literature II
2. Penmanship	2. Physiology	2. Chemistry (2 periods)
3. Arithmetic	3. Latin	

A Course for those who desire to become Telephone Operators

First year	*Second year*	*Third year*
1. English composition	1. English literature I	1. English literature II
2. Penmanship	2. Algebra	2. Physics (2 periods)
3. Arithmetic	3. Hygiene	

A Course for those who desire to become Salesmen or Saleswomen

First year	*Second year*	*Third year*
1. English composition	1. English composition	1. English literature I
2. Penmanship	2. Commerce and industry	2. Business organizations
3. Commercial arithmetic and commercial forms	3. Textiles	3. Salesmanship

Suggestive Evening Courses

1

Municipal government
Economics
Sociology
Civics
Clay modeling
Shopwork or manual training for boys
Arts and crafts
Business English
English composition and rhetoric
Literature
German
French
Latin
Spanish
Elementary algebra
Plane geometry
Solid geometry
Trigonometry
Physical geography
Public speaking and elocution
Elements of music

2

Commercial arithmetic
Penmanship
Business correspondence
Bookkeeping
Accountancy
Stenography
Typewriting
Business and commercial law
Office boys' training
Finance and investments

Money and banking
Importing and exporting
Railway transportation
Advertising
Real estate
Salesmanship
Journalism
Freehand drawing for illustration
Window trimming
Sign-painting
Sign-lettering and show-card writing
Art in house furnishing and decorating

3

Mechanics' business arithmetic
Care of buildings
Industrial design for stonecutters
Architectural drawing for architects
Plan reading and estimating for contractors, masons
Building construction for builders and contractors
Masonry construction for builders
Structural work in steel for builders
Machine drawing, and arithmetic for machinists
Blue-print reading for machinists
Machine design for machinists
Locomotive and car design for draftsmen
Practical electricity
Electric wiring
Electric railways for linemen
Telegraphy
Shop mathematics for machinists
Shop mathematics for engineers
Applied mechanics and strength of material for builders
Applied chemistry for different trades
Metallurgy of iron and steel for beginners in iron works
Marine engineering
Locomotive engineering

Stationary steam engineering or engineer's license
Boiler firing
Ship drafting
Navigation
Surveying
First aid to the injured
Carpentry and building
Pattern-making
Foundry work
Forging
Tool-making
Machine-shop practice
Sheet-metal work
Boiler-making
Metal roofing
Tinsmithing
Plumbing
Heating and ventilation
Steam and hot-water fitting
Bricklaying
Plastering
House-painting
Fresco-painting
Enginemen
Locomotive firemen
Conductors

4

Forestry
Soils
Field crops
Grain grading and judging
Rural economy and farm management
Insects, pests, and plant diseases
Animal husbandry
Poultry husbandry
Dairy husbandry

Methods of teaching

The methods of teaching and the information imparted to the students of the prevocational and vocational continuation schools must differ from those of the regular public-school system. In the general continuation school, the methods will not differ to any great degree from those of the regular evening high schools, but in the vocational classes it is absolutely necessary to observe the principles of teaching that have been used successfully for boys and girls of this group. If we look back upon the age of the apprenticeship in both the shop and the home, we shall find effective methods of teaching. The information necessary for positions in industry, commerce, or the home may be obtained from the actual requirements of the positions.

The apprentice was taught by actual participation in trade work, by imitation, and by suggestions, followed by the information necessary to do the work intelligently. Comenius, in the seventeenth century, reminds school teachers, for instance; that "artisans do not detain their apprentices with theories, but set them to do actual work at an early stage; thus they learn to forge by forging, to carve by carving, to paint by painting. . . . Mechanics do not begin by drumming rules into their apprentices. They take them into the workshop and bid them look at the work that has been produced, and then, when they wish to imitate this, they place tools in their hands, and show them how they should be used and held. Then, if they make mistakes, they give them advice and correct them, often more by example than by mere words, and, as the facts show, the novices easily succeed in their imitation." Similarly, Obadiah Walker in his work, *Of Education*, says: "In manual arts the master first showeth his apprentice what he is to do; next, works it himself, in his presence, and gives him rules, and then sets him to work."

The master craftsman taught and arranged his trade skill and information in a way different from the logical order of the pure arts and sciences. In addition, each journeyman was not allowed to have more than two apprentices. The instruction was individual to a great extent. Since it is impossible to conduct a public school on this basis, it is necessary to have methods adapted to a class of not more than fifteen pupils to a teacher. The shopwork should be organized, as in a commercial shop, into a series of jobs which, for want of a better name, we will call "projects."

The old-fashioned apprenticeship system furnishes us with the steps for teaching effectively the useful arts to boys and girls. The method may be divided into three parts, demonstration by the teacher, practice steps by the pupil, and the test given by the teacher to each pupil. The demonstration should include the preliminary talk to the pupils on such points as the common names of tools; use of tools, blue-prints, or sets of patterns; measurements or steps in shop practice, or sewing, etc. The practice steps should follow the demonstration and should consist of one pupil performing the work under the direction of the teacher in the presence of the class. The teacher should correct all mistakes made by this pupil and offer suggestions at the same time. The last step should be a test given by the teacher to a pupil. The teacher should follow each pupil's work and give individual instruction. Scrap pieces of stock, etc., may be used for drill on certain points that the pupil fails to grasp. The pupil should be taught, as was the apprentice of old, on projects that have commercial value, and the instruction should be carried out in a commercial way.

The old-fashioned teacher has not followed out this scheme in teaching manual training. Instead, he has analyzed the operations by the different tradesmen and has grouped them into exercises of logical sequence. In doing this, he has robbed them of their practical value and of the interest they have to the child. The exercise method may be used in teaching large classes, but fails to give the pupils the true shop and commercial spirit and provides a false idea of economy.

English, history, mathematics, science, drawing, etc., may be taught very effectively by correlating them with the subjects that the pupil is most interested in — shopwork. The practical work in the school, shop, or factory, should consist of at least fifty per cent of the total school time. Every project or job the pupils work on involves some English, mathematics, accounts, history, science, etc. The power that drives the machine involves some part of science and mathematics. After the pupil has worked on a machine or project, there is a natural curiosity to know something more about it. Then is the time to explain abstract principles of science, mathematics, etc. This method of teaching—practice and thinking about the practice — is the most effective way in which a great many young people, who have had difficulty in mastering abstract principles and themes as taught by the old book-method of memorizing, have been made able to grasp them. The practice or observation should always precede the theory, and the two intimately associated together, so that each shall constitute an approach and reinforcement. This is a very different method from that taught to the abstract-minded pupils in the general continuation schools, and to those who are able to grasp abstract principles of drawing, pure mathematics, and pure sciences before application. There is a slight justification for abstract teaching in the general continuation school and in the liberal courses in the regular schools, because it is desirable for pupils who may attend higher technical schools to deal with engineering problems in the abstract, but there is no justification for it in the prevocational classes or vocational continuation courses.

In other words, the method of teaching boys and girls in this type of school is by induction. This is the natural way of learning — observing, comparing, and classifying and forming knowledge, because it awakens interest. Reflection will show the pupil cause and effect.

The step to be followed in the first lessons of the academic department is to assign a pupil a project and hold him responsible not only for the manipulation of the power and hand tools, but for all related knowledge of mathematics, drawing, shop science, etc., connected with the project. He should be able or obliged to make a drawing of it, read a blue-print of it, solve the problems in mathematics that may arise, and explain the principles of science involved in all the operations performed in carrying out the project. In addition, he should be able to write a report on the project, showing his ability to express his ideas and to spell the words.

In order to develop boys and girls to the best advantage during the period of adolescence, it is absolutely necessary to observe the principles of the successful boy and girl life and apply them. The most important period in every child's life is that between the ages of twelve and eighteen years. It is during that period that the child forms his ideals and habits of conduct which will control him in his later years. Every boy has during his adolescence one very marked characteristic, and that is to go with boys of similar interests, to form groups and clubs. All boys desire to be men of achievement. One of the strongest means of interesting a motor-minded child in English, history, and civics is to combine recreation and education under the form of an organization of a club. Each club may have a number of activities under different pupil leaders, the teacher acting with the leader.

English may be taught by reading books and magazines, and by attending talks.

Books

A boy is least fitted to choose the books which are desirable for him to read. His interests at various ages decidedly influence his reading. A boy's library should supplement his early life. As the boy grows, his interests change from those of boyhood to those of manhood. That is the reason why travel, adventure, invention, biography, love-stories, and outdoor books appeal to the interests and needs of boys at various ages. They should read carefully and slowly so as to absorb what they read. Story-telling, with suggestions where more can be read, is helpful. Not all magazines are interesting to boys. They are interested in magazines of outdoor life, invention, handicraft, etc. Practical talks appeal to working boys. The talk should be informal, providing definite information, new incentives for effort, and definite character-building. A talk should suggest a subject on which the pupil will do further reading.

One of the activities of a club may be to study nature. Excursions may be conducted occasionally on Saturday afternoons to the country to study the formation of the land, birds, insects, plants, and trees.

Civics

Every person in this country has more or less to do with the Government. This is the only country in the world that has given to every male citizen of ordinary intelligence the right to vote and to decide how our Government shall be conducted. Therefore, the continuation school should make a special feature of civic training. Those attending it should be taught how to appreciate the ideals of citizenship in this country. How often have we seen within the last few years a great many of our citizens led into practices and conceptions that are dangerous to democracy.

Suggestive Topics for Civics

A. The Individual and the Home and the School.

1. The Relation of the Home and the School to each other and to the Community.
2. The Beginnings of the Community.
    - *a.* The School.
    - *b.* The Occupations of Men and Women.

3. The Individual and the Local Community.
    - *a.* Street Cleaning Department.
    - *b.* Police Department.
    - *c.* Fire Prevention.
    - *d.* Children and Work.
4. The Individual and the City.
    - *a.* The Community.
    - *b.* The Geography of the Community.
    - *c.* The People of the Community.
    - *d.* The Health of the Community.
    - *e.* Defectives, Dependents, etc., of the Community.
    - *f.* Education of the Community.
    - *g.* Civic Beauty of the Community.
    - *h.* Vocational Life of the Community.
5. The Individual and the State and the Union.
    - *a.* Public Utilities.
    - *b.* The Business Life of the Community.
    - *c.* The Government.
    - *d.* Vocational Life.
    - *e.* The Course of Study in the Higher Schools.

In the girls' department of the Fall River Technical High School arithmetic is taught by means of problems dealing with the ordinary affairs of life; that is to say, problems that a girl or woman would meet in the trade in which she is engaged, and in the home.

The subjects of the problems are chosen within the limits of reality. Every woman, no matter what station of life she holds, has more or less business to transact. She has been taught interest in the grammar school and can find the amount of $999 for 9 years, 9 months, 9 days at 9½ per cent, but how many girls can tell you what $500 deposited in the Lawrence Savings Bank, January 1, 1915, would amount to to-day? The girls are taught how to read gas meters, and to figure how much is due the gas company, if the bill is paid early enough to get the discount.

Grammar-school arithmetic teaches how to find the amount of a note, but does not give the penalty or inform pupils of the responsibility attached to signing a note.

Problems in the cost of living are firmly impressed. For example, how will a woman divide her income to dress "well" even when that income seems too small to divide?

Representative Problems

1. I put $500 in the Lawrence Savings Bank, January 1, 1915. I have drawn nothing out. How much have I in the bank? (Banking.)
2. A man buys property worth $3000. He takes out a $2000 mortgage. What will the interest on the mortgage be? If he does not pay the interest, how long can he hold the property? (Mortgage.)

3. Many are asking for lemonade at the lunch counter. What must we charge to cover the cost? (Little or no data given.) (Cooking.)
4. How much Hamburg do you need for the ruffle on your petticoat? What will it cost? (Dressmaking.)
5. How much long cloth will you require to make a 10-inch flounce on your skirt? (Dressmaking.)
6. Make a list of articles for wearing apparel you will need for a year. Keep the cost within $50. (Dressing.)
7. Which is the better off financially, a girl earning $4 a week as a housemaid or earning $7 a week as a salesgirl? (Income.)

A considerable number of arithmetical problems set for girls deal with household affairs, domestic economy, and the results of thrift. When this industrial arithmetic for girls is well taught, it helps to introduce into the homes that methodical spirit which regulates expenses by receipts, inspires foresight, and makes the product of thrift fruitful.

Visual instruction should be used as far as possible in a continuation school. Psychologists tell us that eighty per cent of the sense perceptions of older children and adults reach them through the eye. Eye impressions are eighty per cent stronger than other sense perceptions, as hearing, etc. Therefore, one of the most efficient methods of educating young people is by means of the moving picture. Pictures, charts, outside trips, lantern slides, and models should be used as far as possible in teaching pupils academic subjects.

The above methods apply to the day continuation school. When the pupil changes from the day to the evening continuation school, a slightly different arrangement must be followed on account of the age of the pupil, his educational needs, and the time devoted to different subjects.

A large number of pupils in our elementary general continuation schools are immigrants who cannot speak English. The average evening school teacher finds very little difficulty in teaching the literate immigrant, but there is great difficulty in teaching illiterate immigrants who can and cannot speak English. The reason for this is that the teachers in our regular evening schools are day teachers, and they carry over into the evening classes a great deal of the methods and book material from the day schools. They begin to tell the names of different objects in the room, names of different pieces of clothing they are wearing, something about George Washington, etc. The newly arrived immigrant leaves the school because he is not interested in the information imparted. The people with whom he lives and associates speak his native tongue, and his heroes are not George Washington and Abraham Lincoln, but the heroes of his own country.

The most effective method of teaching the newly arrived immigrant is to teach him the English, the arithmetic, and the information he needs most. He attends an evening school, like all adults, with an intensely practical aim in view — to meet his own daily needs. If he is a weaver in the mill, he is anxious to know how to use sufficient English to talk about his work in the mill: to learn how to pronounce the names of the parts of the machine he is working on, the different devices used by him; to be able to count the different bobbins up to a hundred; to count his pay; to be able to write his name, the number of his loom, or the style of the fabric he is weaving. This is the kind of English, arithmetic, writing, and other information that this pupil is interested in. He has, to be sure, a selfish motive but it has great economic value to him. It is very helpful to the teacher to have the objects you are discussing in the room and to have the pupils go through the lessons dramatically. Foreigners should be classified in evening school according to their vocations (trades), and should be advanced according to the time or progress that they have made since they have been in this country. A few weeks of instruction devoted to English, arithmetic, and other subjects relating to his daily work would form an apperceptive basis for the future lessons on George Washington, and other information in history, civics, and English necessary for him to become a citizen. As far as possible the dramatic method should be used in teaching the pupils.

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